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Report No. CG-D-30-86

**VISUAL SWEEP WIDTH DETERMINATION FOR THREE
VISUAL DISTRESS SIGNALLING DEVICES**

AD-A176 224

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INTERIM REPORT

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16. Abstract During April/May 1986, the U.S. Coast Guard R&D Center conducted a 4-week experiment to study the detectability of three visual distress signalling devices (VDSs). These devices were hand-held orange smoke flares (HHOS), hand-held red flares (HHRF), and white life-ring strobes. All three VDSs are available to the boating public. Realistic searches for these devices were conducted at sea by Coast Guard utility boats (UTBs), patrol boats (WPBs), and HH-52A helicopters. Searcher and target positions were recorded by a precision microwave tracking system, and target detections and environmental conditions were recorded by observers onboard the search craft. Only a limited range of environmental conditions was encountered during data collection, with good visibility and light wind/seas prevailing. Analysis of the data indicated that sweep widths for the signal devices varied with search craft type and time on task. Few environment effects were identified due to the limited range of values represented in the data. Sweep widths for the three devices are compared to values currently promulgated in the National SAR Manual, with some significant difference identified. A study of lookouts' ability to estimate VDS distance is also presented. /			
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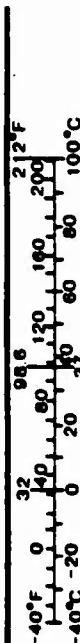
Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply By	To Find	Symbol
LENGTH				
in	inches	* 2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
AREA				
m ²	square inches	6.5	square centimeters	cm ²
ft ²	square feet	0.09	square meters	m ²
yd ²	square yards	0.8	square meters	m ²
mi ²	square miles	2.6	square kilometers	km ²
	acres	0.4	hectares	ha
MASS (WEIGHT)				
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
VOLUME				
tsp	teaspoons	5	milliliters	ml
tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
fl 3	cubic feet	0.03	cubic meters	m ³
yd ³	cubic yards	0.76	cubic meters	m ³
TEMPERATURE (EXACT)				
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

*1 in = 2.54 (exactly) for other exact conversions and more detailed tables, see NBS Misc Publ 286, Units of Weights and Measures. Price \$2.25.
SD Catalog No C13 10 266

Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply By	To Find	Symbol
LENGTH				
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
mi	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
AREA				
cm ²	square centimeters	0.16	square inches	in ²
m ²	square meters	1.2	square yards	yd ²
km ²	square kilometers	0.4	square miles	mi ²
ha	hectares (10,000 m ²)	2.5	acres	
MASS (WEIGHT)				
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
VOLUME				
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	0.125	cups	c
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m ³	cubic meters	35	cubic feet	ft ³
m ³	cubic meters	1.3	cubic yards	yd ³
TEMPERATURE (EXACT)				
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



CONTENTS

	<u>Page</u>
EXECUTIVE SUMMARY	xi
ACKNOWLEDGEMENTS	xxi
1. INTRODUCTION	1-1
1.1 SCOPE AND OBJECTIVES	1-1
1.2 EXPERIMENT DESCRIPTION	1-2
1.2.1 Participants	1-2
1.2.2 Exercise Area	1-3
1.2.3 Targets	1-5
1.2.4 Experiment Design and Conduct	1-6
1.2.5 Tracking and Reconstruction	1-11
1.2.6 Range of Environmental Conditions	1-11
1.3 ANALYSIS APPROACH	1-12
1.3.1 Measure of Search Performance	1-12
1.3.2 Analysis of Visual Search Data	1-18
2. RESULTS	2-1
2.1 INTRODUCTION	2-1
2.2 VISUAL SEARCH PERFORMANCE	2-2
2.2.1 Detection of HHOS Signals	2-2
2.2.2 Detection of HHRF Signals	2-6
2.2.3 Detection of Strokes	2-6
2.2.4 Sighting Range Estimation Errors	2-14
2.2.5 Influence of Sun Relative Bearing on HHOS Detection	2-19
2.2.6 Sweep Width Comparisons	2-20
3. CONCLUSIONS AND RECOMMENDATIONS	3-1
3.1 CONCLUSIONS	3-1
3.1.1 Detection of HHOS Signals	3-1
3.1.2 Detection of HHRF Signals	3-2
3.1.3 Detection of Strokes	3-3
3.1.4 General	3-5

CONTENTS (Continued)

	<u>Page</u>
3.2 RECOMMENDATIONS	3-5
3.2.1 Search Planning Procedures	3-5
3.2.2 Future VDS Research	3-6
REFERENCES	R-1
APPENDIX A -- RAW DATA	A-1

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A-1	



ILLUSTRATIONS

<u>Figure</u>		<u>Page</u>
1-1	April and May 1986 Exercise Area	1-4
1-2	Example of Creeping Line and Parallel Search Execution	1-7
1-3	Sample Environmental Conditions Summary Form	1-8
1-4	Sample VDSO Activation Log	1-9
1-5	Sample Visual Sighting Report Form	1-10
1-6	Example of MTS Real-Time Display	1-12
1-7	Definition of Lateral Range	1-14
1-8	Relationship of Targets Sighted to Targets Not Sighted	1-15
1-9	Graphic and Pictorial Presentation of Sweep Width	1-16
2-1	Target Detection Probability Versus Lateral Range: 41-Foot UTBs Searching for HHOS	2-3
2-2	Target Detection Probability Versus Lateral Range: 82/95-Foot WPBs Searching for HHOS	2-4
2-3	Target Detection Probability Versus Lateral Range: HH-52A Helicopters Searching for HHOS (1000-foot altitude) .	2-5
2-4	Target Detection Probability Versus Lateral Range: 41-Foot UTBs Searching for HHRF	2-7
2-5	Target Detection Probability Versus Lateral Range: 82/95-Foot WPBs Searching for HHRF	2-8
2-6	Target Detection Probability Versus Lateral Range: HH-52A Helicopters Searching for HHRF (1000-foot altitude) .	2-9
2-7	Target Detection Probability Versus Lateral Range: 41-Foot UTBs Searching for Strobe	2-10
2-8	Target Detection Probability Versus Lateral Range: 82/95-Foot WPBs Searching for Strobe	2-11
2-9	Target Detection Probability Versus Lateral Range: HH-52A Helicopters Searching for Strobe (1000-foot altitude)	2-12

TABLES

<u>Table</u>	<u>Page</u>
1 VDSO Search Data Quantities	xii
2 Environmental Conditions Encountered	xiii
3 Comparison of SAR Manual Sweep Widths for VDSOs With Experiment Sweep Width Predictions (all sweep widths in nautical miles)	xiv
4 Sweep Width Values (in nautical miles) for 41-Foot UTBs, 82/95 Foot WPBs, and HH-52As Searching for HHOS Distress Signals During Daylight Hours	xvi
5 Sweep Width Values (in nautical miles) for 41-Foot UTBs 82/95 Foot WPBs, and HH-52As Searching for HHRF Distress Signals at Night	xvii
6 Sweep Width Values (in nautical miles) for 41-Foot UTBs 82/95 Foot WPBs, and HH-52As Searching for White Strobe at Night	xviii
7 Sweep Width Values (in nautical miles) for 41-Foot UTBs, 82/95 Foot WPBs, and HH-52As Searching for White Strobe at Night	xviii
1-1 VDSO Descriptions	1-5
1-2 Environmental Conditions Encountered	1-13
2-1 VDSO Search Data Quantities	2-1
2-2 Range Estimation Error Statistics - HHOS Targets	2-16
2-3 Range Estimation Error Statistics - HHRF Targets	2-17
2-4 Range Estimation Error Statistics - Strobe Targets	2-18
2-5 Comparison of Sweep Width Values (in nautical miles) for 41-Foot UTBs and 82/95-Foot WPBs Searching for HHOS and HHRF Versus White 16-Foot Boat or Orange Canopied Life Raft	2-21
2-6 Comparison of Sweep Width Values (in nautical miles) for Helicopters Searching for HHOS and HHRF Versus White 16-Foot Boat or Orange Canopied Life Raft	2-22
2-7 Comparison of Sweep Width Values (in nautical miles) for 41-Foot UTBs and 82/95-Foot WPBs Searching for STROBE Versus PIW	2-23

TABLES (Cont'd)

<u>Table</u>		<u>Page</u>
2-8	Comparison of Sweep Width Values (in nautical miles) for HH-52A Helicopters Searching for Strobe Versus PIW	2-24
2-9	Comparison of SAR Manual Sweep Widths for VDSDs With Experiment Sweep Width Predictions (all sweep widths in nautical miles)	2-24
3-1	Sweep Width Values (in nautical miles) for 41-Foot UTBs, 82/95 Foot WPBs, and HH-52As Searching for HHOS Distress Signals During Daylight Hours	3-2
3-2	Sweep Width Values (in nautical miles) for 41-Foot UTBs 82/95 Foot WPBs, and HH-52As Searching for HHRF Distress Signals at Night	3-3
3-3	Sweep Width Values (in nautical miles) for 41-Foot UTBs 82/95 Foot WPBs, and HH-52As Searching for White Strobe at Night	3-4
3-4	Sweep Width Values (in nautical miles) for 41-Foot UTBs, 82/95 Foot WPBs, and HH-52As Searching for White Strobe at Night	3-4

EXECUTIVE SUMMARY

INTRODUCTION

1. Background

This report presents an evaluation of factors affecting the sweep widths of three visual distress signalling devices (VDSs). Data for this evaluation were collected during an experiment conducted off the coast of southern New Jersey during April and May 1986. The experiment was conducted by the U.S. Coast Guard Research and Development Center (R&D Center) in cooperation with Coast Guard Group Cape May, NJ, as part of the Improvement in Probability of Detection in Search and Rescue (POD/SAR) Project.

2. VSD Description

The VSDs evaluated for daytime use were hand-held orange smoke (HHOS) flares. For nighttime use, 500-candlepower hand-held red flares (HHRF) and white, 50,000 peak candlepower life-ring strobes were evaluated. All three devices are available to the boating public.

3. Data Collection

Realistic search missions were conducted by 41-foot UTBs, 82/95-foot WPBs, and HH-52A helicopters from Coast Guard Group Cape May to generate detection performance data. Only one of the three VSD types was deployed during each search. Up to 10 targets were present within the search area at any given time.

Target and search craft positions were monitored constantly and recorded 2 to 4 times per minute by a computer-controlled microwave tracking system (MTS). Detections, environmental conditions, and target activation/deactivation times were recorded by R&D Center Field Team personnel onboard the search and target craft.

RESULTS

1. Data Quantities and Environmental Conditions

A total of 1703 target detection opportunities were generated during the experiment in moderate to excellent environmental conditions. Table 1 summarizes the quantities of data collected for each search unit/target type combination. Table 2 summarizes the range of environmental conditions represented in each data subset.

TABLE 1
VDSO SEARCH DATA QUANTITIES

SRU TYPE	VDSO DETECTION OPPORTUNITIES		
	HHOS	HHRF	STROBE
41-FOOT UTB	50	278	309
82/95-FOOT WPB	117	211	27
HH-52A HELICOPTER	56	156	499

2. Significant Search Parameters and Sweep Widths

Search parameters found to exert significant influence on the sweep widths achieved during the experiment are:

Surface Craft:

HHOS & HHRF - Search Unit Type (UTB versus WPB)
Time on Task

Strobe - Search Unit Type (UTB versus WPB)
Time on Task
Wind Speed

TABLE 2
ENVIRONMENTAL CONDITIONS ENCOUNTERED

SRU/VDSD COMBINATION	RANGE OF ENVIRONMENTAL PARAMETERS			
	VISIBILITY (nm)	WIND SPEED (knots)	CLOUD COVER (percent)	WAVE HEIGHT (feet)
41-FOOT UTB/HHOS	5 to 10	1 to 7	20 to 100	1 to 2.5
82/95-FOOT WPB/HHOS	11	2 to 9	30	1.5 to 2
HH-52A HELICOPTER/HHOS	11	2 to 9	30	1.5 to 2
41-FOOT UTB/HHRF	7 to 15	2.5 to 20	0 to 100	1 to 2.5
82/95-FOOT WPB/HHRF	7 to 10	2.5 to 20	0 to 100	1 to 2.5
HH-52A HELICOPTER/HHRF	7 to 15	2.5 to 20	10 to 100	1 to 2.5
41-FOOT UTB/STROBE	5 to 20	4 to 15	20 to 100	1 to 4
82/95-FOOT WPB/STROBE	5	15	100	3 to 4
HH-52A HELICOPTER/STROBE	5 to 20	4 to 15	20 to 100	1 to 4

Helicopters:

HHOS & HHRF - None identified

Strobe - Time on Task

The reader is cautioned that other search parameters, especially environmental parameters such as visibility and wave height, may also have significant effects on VDSO sweep width. These effects may not have been identified during analysis of the experiment data due to the narrow range of weather represented. Table 3 summarizes the VDSO sweep widths computed from experiment data and compares them to values provided in the National SAR Manual.

TABLE 3
COMPARISON OF SAR MANUAL SWEEP WIDTHS FOR VDSOs WITH EXPERIMENT
SWEEP WIDTH PREDICTIONS (ALL SWEEP WIDTHS IN NAUTICAL MILES)

DEVICE	SAR MANUAL SWEEP WIDTH	41-FT UTB SWEEP WIDTH	82/95 -FT WPB SWEEP WIDTH	HELICOPTER SWEEP WIDTH
HHOS	5.0	2.8 to 4.6	5.0 to 6.9	7.7
HHRF	8.0	10.2 to 10.7	12.6 to 13.0	15.4
STROBE	10.0	1.1 to 3.9	1.1 to 3.9	3.9 to 4.4

Note : SAR manual sweep widths apply to all search units and assume good visibility.
The HHOS sweep width assumes light winds.

3. Range Estimation Errors

An analysis of the differences between actual and reported target ranges was performed to quantify the accuracy of distance-to-target estimates given by lookouts. These range estimation errors were found to vary a great deal with search unit type, target type, and target range itself. In general, the magnitude of the errors grew larger as distance to the target increased. Lookouts always tended to underestimate distance when target range was beyond 4 nautical miles. No clear error pattern was found for target ranges less than 4 nautical miles.

CONCLUSIONS

1. Detection of HHOS Signals

- a. In clear, calm weather, sweep widths for daytime HHOS searches conducted by surface SRUs are similar to sweep widths for small, high-contrast passive targets such as 16-foot white boats and 4- to 6-person orange canopied life rafts.
- b. Sweep width for daytime HHOS searches conducted in clear, calm weather by helicopter SRUs is about twice the sweep width for small, high-contrast passive targets.
- c. In searches conducted by surface SRUs, HHOS appears to function more as an aid to distinguish distressed craft from others than as an aid to target detection. In searches by helicopters, both functions are served.
- d. Surface SRU sweep widths for HHOS are about the same as the 5-nautical-mile value provided in the National SAR Manual (table 4). Helicopter sweep widths are about 1.5 times this value (table 4).

TABLE 4
SWEEP WIDTH VALUES (IN NAUTICAL MILES) FOR 41-FOOT UTBs
82/95-FOOT WPBs, AND HH-52As SEARCHING FOR HHOS DISTRESS SIGNALS
DURING DAYLIGHT HOURS

SRU TYPE	Time on Task (hr)		Environmental Conditions Represented			
	1	3	Visibility (nm)	Wind Speed (knots)	Cloud Cover (percent)	Sig. Wave Height (ft)
UTB	4.6	2.8	5 to 10	<= 7	20 to 100	1 to 2.5
WPB	6.9	5.0	11	<= 9	30	1.5 to 2
HH-52A	7.7		11	<= 9	30	1.5 to 2

- e. The bearing of the sun relative to an HHOS signal does not appear to have a significant effect on its detectability by surface or air SRUs.

2. Detection of HHRF Signals

- a. In clear weather, sweep widths for nighttime HHRF searches conducted by surface SRUs can be nearly triple the sweep widths for daytime searches for small, high-contrast passive targets.
- b. In clear weather, sweep width for nighttime HHRF searches conducted by helicopter SRUs can be more than triple the sweep width for daytime searches for small, high-contrast passive targets.
- c. Surface SRU sweep widths for HHRF signals are 30 to 60 percent larger than the 8 nautical mile value in the National SAR Manual (table 5). The sweep width for helicopter SRUs is nearly double the National SAR Manual value (table 5).

TABLE 5
SWEEP WIDTH VALUES (IN NAUTICAL MILES) FOR 41-FOOT UTBs,
82/95-FOOT WPBs and HH-52As SEARCHING FOR HHRF DISTRESS SIGNALS
AT NIGHT

SRU TYPE	Time on Task (hr)		Environmental Conditions Represented			
	1	3	Visibility (nm)	Wind Speed (knots)	Cloud Cover (percent)	Sig. Wave Height (ft)
UTB	10.7	10.2	7 to 15	2.5 to 20	0 to 100	1 to 2.5
WPB	13.0	12.6	7 to 10	2.5 to 20	0 to 100	1 to 2.5
HH-52A	15.4		7 to 15	2.5 to 20	10 to 100	1 to 2.5

3. Detection of Strobes

- a. In clear weather, sweep widths for night searches for life-ring type strobes conducted by surface and helicopter SRUs are 3 to 10 times greater than sweep widths for daytime person-in-water (PIW) searches.
- b. Surface and helicopter SRU sweep widths for life-ring type strobes are only 11 to 44 percent as large as the 10-nautical-mile value provided for life jacket strobes in the National SAR Manual (tables 6 and 7).

TABLE 6
SWEEP WIDTH VALUES (IN NAUTICAL MILES) FOR 41-FOOT UTBs AND
82/95-FOOT WPBs SEARCHING FOR WHITE STROBE AT NIGHT

SRU TYPE	Time on Task (hr)				Environmental Conditions Represented			
	1		3		Visiblity (nm)	Wind Speed (knots)	Cloud Cover (percent)	Sig. Wave Height (ft)
	Wind Speed (kts)							
	6	15	6	15				
UTB	3.9	2.6	2.1	1.1	5 to 20	4 to 15	20 to 100	1 to 4
WPB	3.9	2.6	2.1	1.1	5	15	100	3 to 4

TABLE 7
SWEEP WIDTH VALUES (IN NAUTICAL MILES) FOR HH-52As SEARCHING FOR
WHITE STROBE AT NIGHT

SRU TYPE	Time on Task (hr)		Environmental Conditions Represented			
	0.5	1.5	Visibility (nm)	Wind Speed (knots)	Cloud Cover (percent)	Sig. Wave Height (ft)
HH-52A	4.4	3.9	5 to 20	4 to 15	20 to 100	1 to 4

4. General

VDSO target range estimates provided by lookouts are subject to substantial errors and scatter, especially at night. The magnitude of the errors grows with target range.

RECOMMENDATIONS

1. Search Planning Procedures

- a. The sweep width values presented in this report for HHOS (table 4), HHRF (table 5), and strobe (tables 6 and 7) VDSOs should be used by Coast Guard search planners, where applicable, in lieu of the estimates provided in the National SAR Manual.
- b. Search units should use every available means to make themselves visible and identifiable to distressed craft when VDSOs may be used. VDSO sweep widths presented in this report include an implicit assumption that the distressed vessel is able to detect the SRU and signal in response to its presence.
- c. Search crews should maintain, to the extent possible, a full 360-degree scan during VDSO searches. A VDSO might be activated only after the search unit has passed the distressed craft's position. A second chance may not occur.
- d. Search crews should be aware that range estimates involving VDSOs are subject to substantial error, especially at night.

2. Future VDS Research

- a. Evaluations of other common VDSs should be conducted to develop sweep width estimates. The methodology described in this report is recommended for future VDS evaluations.
- b. Additional strobe search data should be obtained using WPB-class search units so that better sweep width estimates can be developed.
- c. Additional data should be collected for helicopter/HHRF searches to better define the lateral range curve beyond 6 nautical miles. Revised sweep width estimates should be developed based on the additional data.
- d. Data should be collected using fixed-wing aircraft search units to develop VDS sweep widths. No such data are currently available.

ACKNOWLEDGEMENTS

The authors would like to acknowledge the support and cooperation of the various units and people of Coast Guard Group Cape May without whom the experiment would not have been possible. We would also like to thank the Seamanship School of the CG Training Center at Cape May, NJ, for providing support and dockage for the R&DC UTB. The time and effort of the following people from the R&DC, Analysis & Technology, Inc., and IOCS, Inc. was essential to the success of this experiment and is greatly appreciated: A. Allen, M. Couturier, M. Ensminger, S. Eynon, M. Kop, W. Moody, L. Nash, T. Noble, R. Sager, D. Sanford, R. Vorthman, and J. Willcox.

Chapter 1 INTRODUCTION

1.1 SCOPE AND OBJECTIVES

This report documents a field experiment and subsequent data analysis conducted by the U.S. Coast Guard Research and Development Center (R&D Center) to evaluate the detectability of selected visual distress signalling devices (VDSs).

This experiment, conducted from 15 April to 8 May 1986, was performed as part of the R&D Center's Improvement in Probability of Detection (POD) in Search and Rescue (SAR) project. Project objectives are to:

1. Develop a more precise visual sweep width model,
2. Develop electronic sweep width models,
3. Formulate POD to fit the actual search,
4. Improve leeway drift prediction methods,
5. Improve near-shore and open-ocean drift prediction, and
6. Determine detection ranges of VDSs and their effect on visual search sweep width.

The research documented in this report was conducted to evaluate the visual detection performance of operational crews onboard HH-52A helicopters, 41-foot utility boats (UTBs), and 82/95-foot patrol boats (WPBs) when searching for selected VDSs. Objectives 1, 3, and 6 are addressed in this report. Previous POD/SAR Project research on VDSs is reported in reference 1. Long-term target drift data collected during this same experiment will be documented in a separate report.

1.2 EXPERIMENT DESCRIPTION

1.2.1 Participants

This experiment was conducted and controlled by the Coast Guard Research and Development Center, Groton, Connecticut. A field team consisting of Coast Guard military and civilian personnel from the R&D Center and contractor personnel performed on-site monitor, control, and data collection functions. The R&D Center's 42-foot UTB served as a target deployment vessel, a search vessel, and the weather observatory. The R&D Center provided tracking equipment, targets, and other logistics support to the POD/SAR Field Team.

Coast Guard Group Cape May provided communications and logistics support through SAR Detachment (SARDET) Townsends Inlet and through Group headquarters.

Boats and helicopters from Coast Guard Group Cape May were the primary platforms for conducting search and deploying targets as indicated below:

<u>Participating Vessels</u>	<u>Parent Command</u>	<u>Exercise Function</u>
21-foot UTLs	Various Group SAR stations and SAR detachments	Signal devices
41-foot UTBs	Various Group SAR stations and SAR detachments	Signal devices and search vessels
82/95-foot WPBs	Group Cape May	Search vessels
HH-52A Helicopters	Coast Guard Air Station Cape May, NJ	Search aircraft

Participating Coast Guard SAR stations and SAR detachments were:

1. Station Cape May, Cape May, NJ;
2. Station Great Egg, Ocean City, NJ;
3. Station Atlantic City, Atlantic City, NJ;
4. Station Indian River Inlet, Rehoboth Beach, DE;
5. Coast Guard Air Station Cape May, Cape May, NJ;
6. SARDET Townsends Inlet, Sea Isle City, NJ;
7. SARDET Fortescue, Fortescue, NJ;
8. USCGC CAPE STARR (WPB 95320), Atlantic City, NJ;
9. USCGC POINT BATAN (WPB 82340), Cape May, NJ; and
10. USCGC POINT FRANKLIN (WPB 82350), Cape May, NJ.

1.2.2 Exercise Area

A 10- by 20-nautical mile rectangle, centered in the Atlantic Ocean off Sea Isle City, NJ, at 39°03.2'N, 74°32.45'W, was the primary exercise area during the experiment (see figure 1-1). The area was oriented along a major axis of 045 degrees magnetic. Figure 1-1 depicts the locations of tracking system equipment, described in section 1.2.3, and the locations of participating Coast Guard stations.

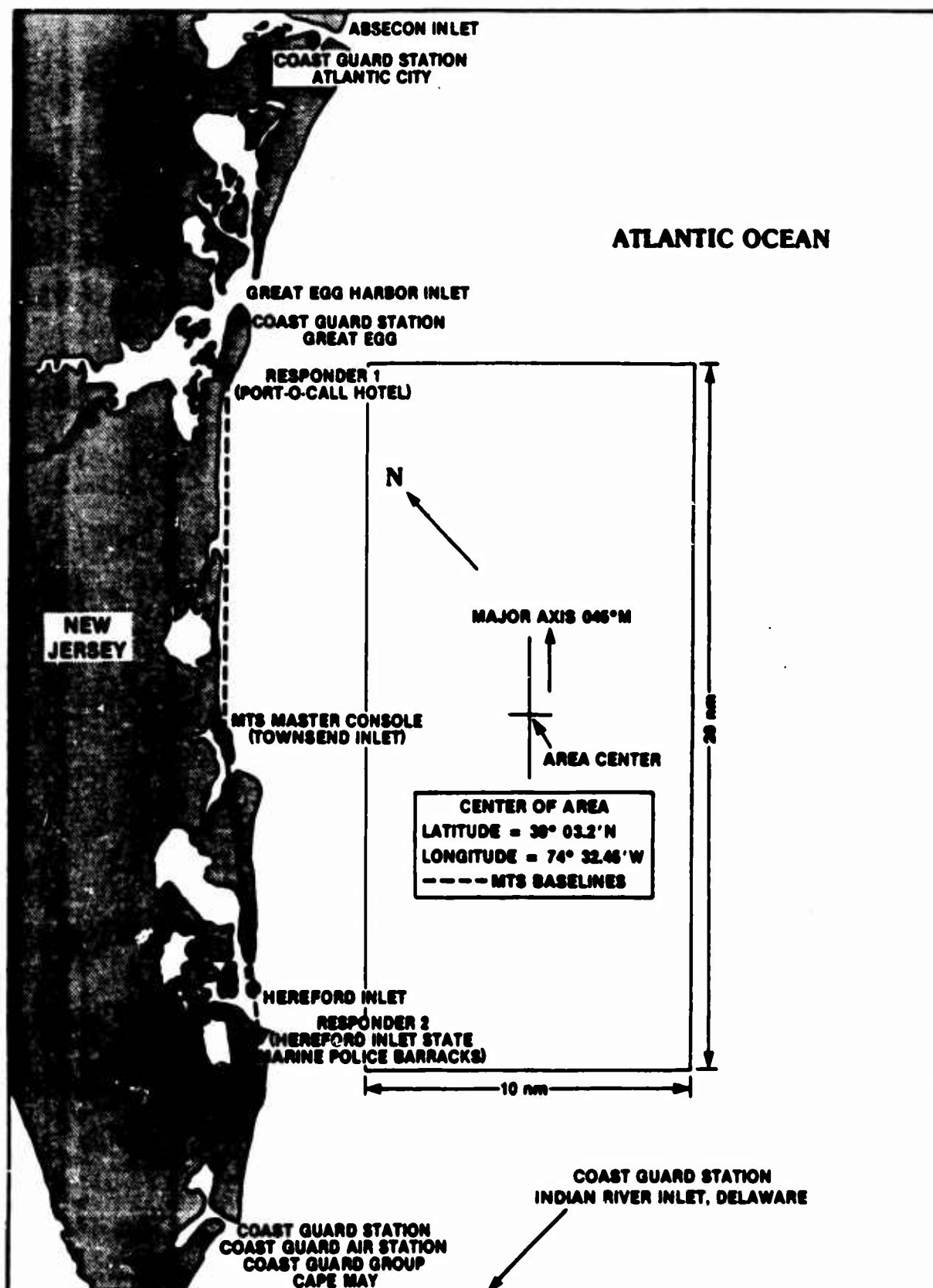


Figure 1-1. April and May 1986 Exercise Area

1.2.3 Targets

Because experiment time was limited, only three VDSDs were tested so that a substantial data set could be collected on each device. The three devices were selected based on results of a preliminary R&D Center test conducted in 1984 (reference 1). The VDSDs selected were hand-held orange smoke (HHOS) flares for daytime evaluations, short-range (500 candlepower) hand-held red flares (HHRF) for nighttime evaluations, and mannequins with personal flotation devices (PFDs) and "man-overboard" strobes for nighttime evaluations. The HHOS flare was the more visible of two daytime signals tested in 1984; the HHRF was the most economical night pyrotechnic signal and had a night detection range within tracking system limits; and the "man-overboard" strobe was similar to, but brighter than, a PFD strobe that was difficult to detect in the 1984 test. An additional requirement for device selection was that the device last long enough for a distressed vessel to be located, not simply long enough to alert potential rescuers as would be the case with launched pyrotechnics.

Table 1-1 provides pertinent information for the three VDSDs tested. All three VDSDs are available to the boating public.

TABLE 1-1
VDSD DESCRIPTIONS

DEVICE NUMBER	DESCRIPTION	USCG NUMBER	MANUFACTURER	APPLICATIONS	ADVERTISED LUMINOUS INTENSITY (candle)	DURATION
1	Hand-Held Orange Smoke Flare (HHOS)	160.037	Olin Corp Bristol Corp	Day	N/A	50 sec 2 min
2	Hand-Held Red Flare (HHRF)	160.021	Olin Corp Bristol Corp	Night	500	2 min 3 min
3	Guest Model 301A Strobe (white)	161.013	Guest Corp	Night	50,000 (peak)	Several days

1.2.4 Experiment Design and Conduct

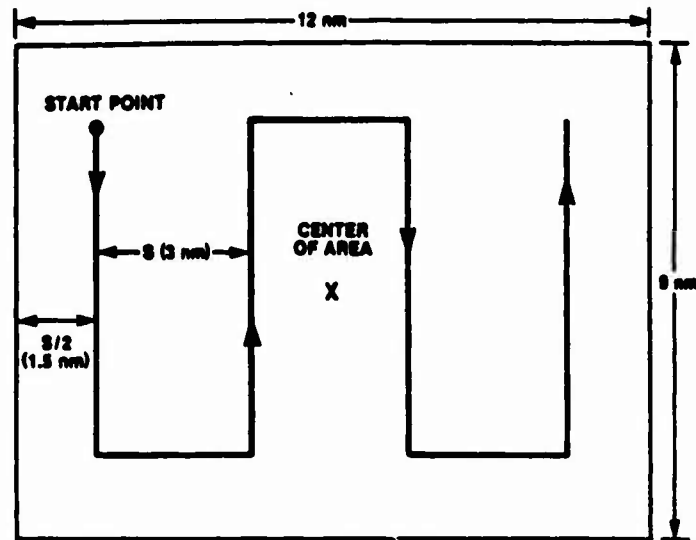
Detection data were obtained by conducting realistic search missions for the three types of VDSDs. Operational SAR units (SRUs), following standard Coast Guard procedures, conducted search missions to provide detection performance data that would accurately reflect the VDSD search capabilities of Coast Guard resources.

A daily SAR Exercise (SAREX) message provided SRUs with target information and specific search patterns to be executed. Figure 1-2 provides examples of the two search patterns used for data collection. Target deployment vessels launched VDSDs according to instructions provided daily. Controllable parameters such as search area, track spacing, and starting points were assigned to fulfill specific data-collection objectives. Onboard observers recorded essential data and coordinated unit activities with R&D Field Team control personnel.

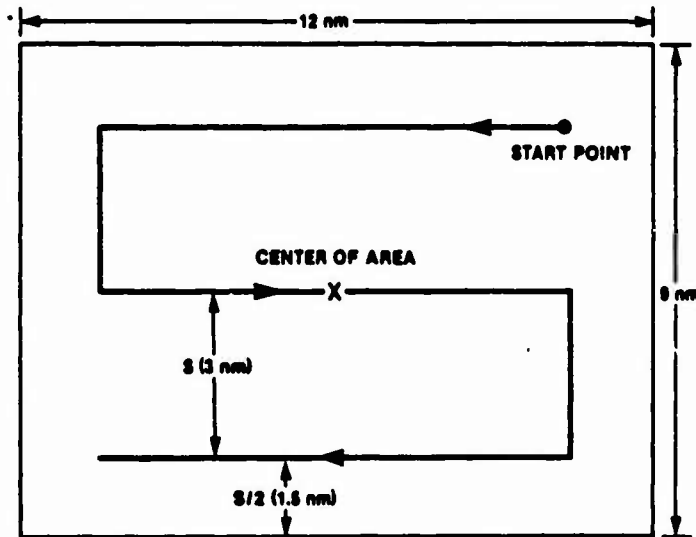
Each SRU reported the environmental conditions to the onboard observer at the beginning and the end of each search and whenever any changes were detected. SRUs equipped with environmental sensors used them for parameter measurements; other SRUs estimated the conditions. The observers recorded these measurements on an Environmental Conditions Summary (figure 1-3).

Each VDSD activation was logged onboard target vessels (see figure 1-4). Each log entry included signal start/end times, stimulus that prompted the decision to activate a signal, and any comments concerning misfires or other nonstandard occurrences.

Onboard the SRUs, the detection of a target was immediately relayed to the observer with range and relative bearing of the initial contact and a brief description (see figure 1-5). Each detection was verified during post-exercise analysis by comparing the reported sightings with position fixes on targets and SRUs.



A. EXAMPLE OF CREEPING LINE SEARCH



B. EXAMPLE OF PARALLEL SEARCH

NOTE: S = TRACK SPACING

Figure 1-2. Example of Creeping Line and Parallel Search Execution

*Significant wave height.
**Note: Method may be scientific (anemometer, radar, psychrometer, etc) or an estimate. Indicate method used to measure each parameter.

1-8

Vessel No. _____
Responder Code _____
Date _____
Observer _____

Sheet of [illegible]

Figure 1-4. Sample VSD Activation Log

Date _____

Aircraft/Boat No. _____
Responder Code _____

Search Start Time	Search End Time	Search Duration
-------------------	-----------------	-----------------

Search _____
Speed _____
Altitude _____

[illegible]**OBSERVER**

Figure 1-5. Sample Visual Sighting Report Form

1.2.5 Tracking and Reconstruction

Target locations and SRU positions were monitored using an automated microwave tracking system (MTS) consisting of a Motorola Falcon mobile tracking system coupled with a Hewlett-Packard desktop computer. This system was developed by the Coast Guard R&D Center for the POD/SAR Project to provide target positioning and search track reconstruction accurate to better than 0.1 nautical mile. A detailed description of the operation of this system can be found in reference 2.

The master tracking station was located at SARDET Townsends Inlet. Two reference stations were located at Port-O-Call Hotel, Ocean City, NJ, and Hereford Inlet State Marine Police Barracks, North Wildwood, NJ. These locations, which facilitated line-of-sight tracking of searcher and target positions, are depicted in figure 1-1.

Target and search unit positions were monitored continuously by the MTS, displayed on a CRT in real-time, and recorded on microcomputer floppy disk every 15 to 30 seconds. Recorded target and SRU position data were used to generate an 8- by 12-inch hard copy plot of each search. Target positions were marked on these plots with a letter whenever a VDSD was activated. The search unit tracks were plotted with a '+' to designate every fifth fix point. A hard copy chronology of search and target vessel positions was also generated to accompany the plot of each search. An example of the real-time MTS display is shown in figure 1-6.

1.2.6 Range of Environmental Conditions

Environmental search conditions during data collection were generally good to excellent characterized by visibilities greater than 7 nautical miles, light to moderate winds, and low sea state. Exceptions to this occurred on the first three data collection days (15, 17, and 22 April) when visibility was 5 nautical miles or less and (on 22 April only) when seas were 3 to 4 feet.

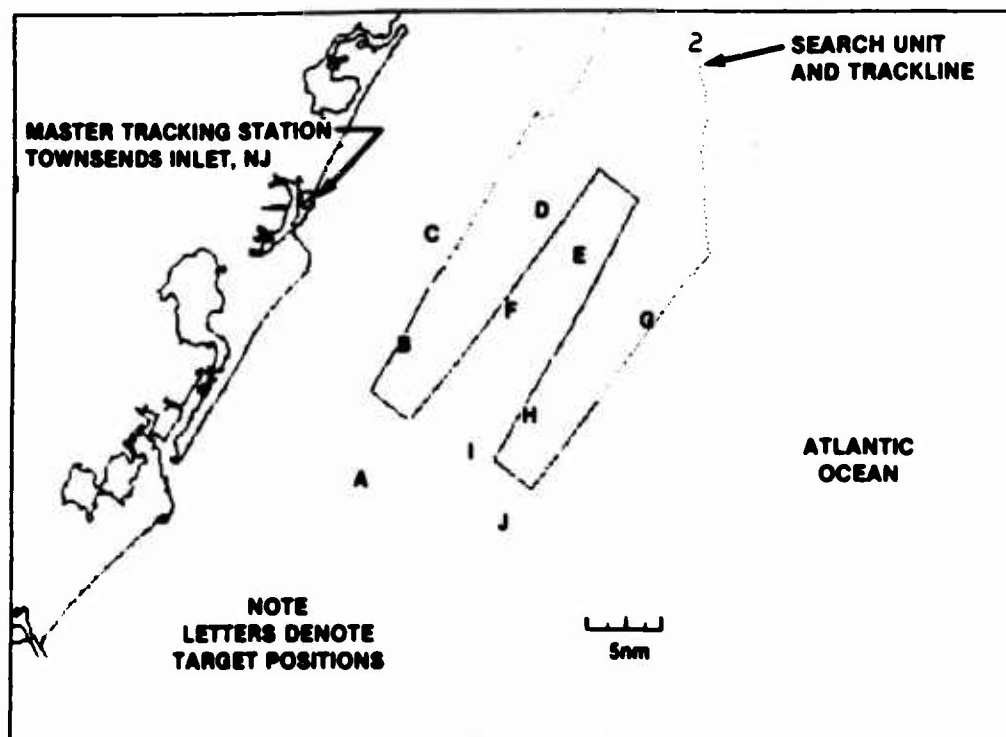


Figure 1-6. Example of MTS Real Time Display

Table 1-2 summarizes the range of environmental conditions encountered during the experiment by target and SRU type.

1.3 ANALYSIS APPROACH

1.3.1 Measure of Search Performance

Visual search performance was evaluated by computing the VDSO sweep widths achieved by the SRUs for various combinations of significant search parameters. These sweep widths were compared to sweep widths achieved by similar Coast Guard aircraft and boats searching for passive targets during earlier R&D Center experiments. The next subsections describe sweep width and search parameter variables in detail.

TABLE 1-2
ENVIRONMENTAL CONDITIONS ENCOUNTERED

SRU/VDS COMBINATION	RANGE OF ENVIRONMENTAL PARAMETERS			
	VISIBILITY (nm)	WIND SPEED (knots)	CLOUD COVER (percent)	WAVE HEIGHT (feet)
41-FOOT UTB/HHOS	5 to 10	1 to 7	20 to 100	1 to 2.5
82/95-FOOT WPB/HHOS	11	2 to 9	30	1.5 to 2
HH-52A HELICOPTER/HHOS	11	2 to 9	30	1.5 to 2
41-FOOT UTB/HHRF	7 to 15	2.5 to 20	0 to 100	1 to 2.5
82/95-FOOT WPB/HHRF	7 to 10	2.5 to 20	0 to 100	1 to 2.5
HH-52A HELICOPTER/HHRF	7 to 15	2.5 to 20	10 to 100	1 to 2.5
41-FOOT UTB/STROBE	5 to 20	4 to 15	20 to 100	1 to 4
82/95-FOOT WPB/STROBE	5	15	100	3 to 4
HH-52A HELICOPTER/STROBE	5 to 20	4 to 15	20 to 100	1 to 4

1.3.1.1 Sweep Width

The primary performance measure currently used by SAR mission coordinators to plan visual searches is sweep width (W). Sweep width is a single-number summation of a more complex range/detection probability relationship. Mathematically,

$$\text{Sweep Width (W)} = \int_{-\infty}^{+\infty} P(x)dx ,$$

where

x = lateral range or closest point of approach to targets of opportunity (see figure 1-7) and

$P(x)$ = probability of detection at lateral range x .

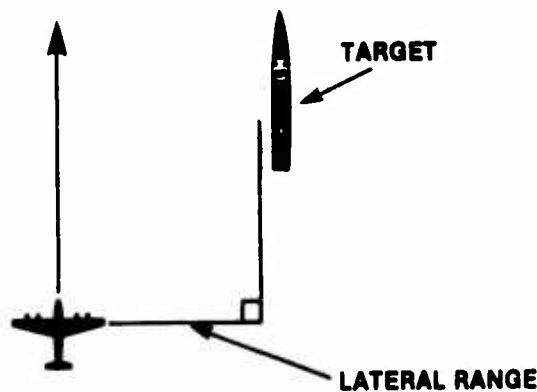


Figure 1-7. Definition of Lateral Range

Figure 1-8 shows a typical $P(x)$ curve as a function of lateral range. In figure 1-8, (x) is the lateral range of detection opportunities.

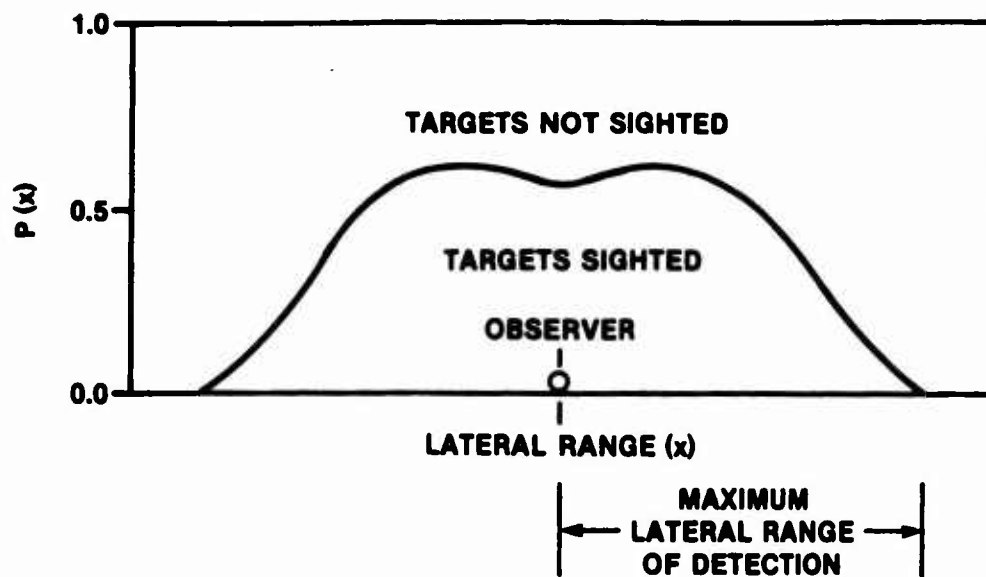


Figure 1-8. Relationship of Targets Sighted to Targets Not Sighted

Conceptually, sweep width is the numerical value obtained by reducing the maximum detection distance of any given sweep so that scattered targets that may be detected beyond the limits of W are equal in number to those that may be missed within those limits. Figure 1-9 (A and B) illustrates this concept of sweep width. The number of targets missed inside the sweep width distance is indicated by the shaded portion near the top middle of the rectangle (area A); the number of targets sighted beyond the sweep width distance out to maximum detection range (R_D) is indicated by the shaded portion at each end of the rectangle (area B). Referring only to the shaded areas, when the number of targets missed equals the number of targets sighted (area $A = \text{area } B$), sweep width is defined. A detailed mathematical development and explanation of sweep width can be found in reference 3.

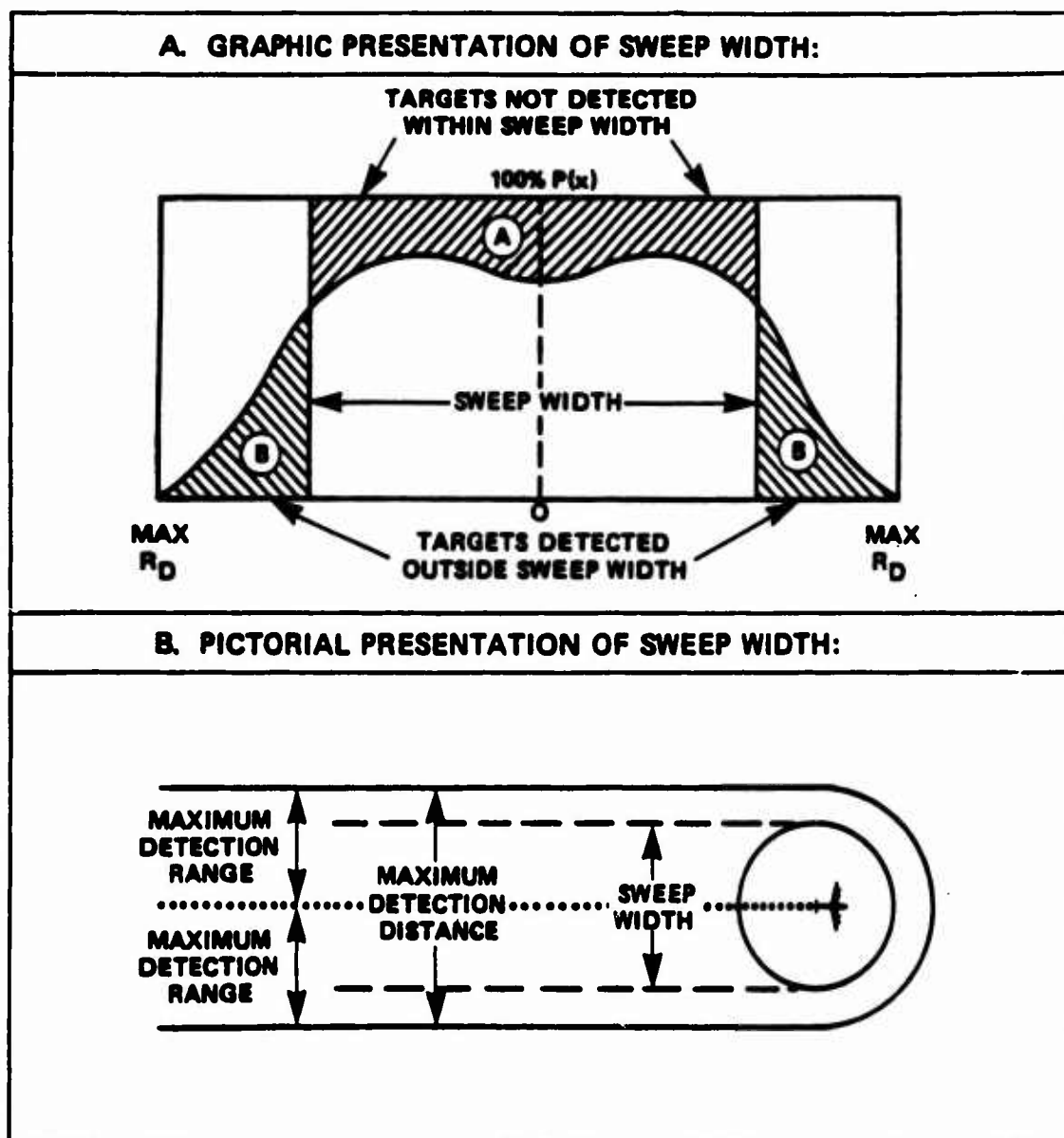


Figure 1-9. Graphic and Pictorial Presentation of Sweep Width

1.3.1.2 Search Parameter Variables

From literature research, 25 parameters have been identified as having a potential influence on visual sweep width. These parameters can be divided into three categories:

1. Primary, independent measurable parameters,
2. Interdependent human factors, and
3. Secondary parameters.

Primary variables are those that have been investigated during the series of POD/SAR Project visual detection experiments. They are:

1. SRU type,
2. Target type (size, shape, and color),
3. Meteorological visibility*,
4. Altitude,
5. Search speed,
6. Time on task,
7. Wind speed,
8. Sun elevation,
9. Significant wave height (H_s),** and
10. Cloud cover.

All 10 primary variables were recorded during this experiment. All variables except altitude and search speed were analyzed to determine their effects on the visual search performance of HH-52A helicopters, 41-foot UTBs, and 82/95-foot WPBs when searching for VDSDs. Altitude was restricted to 1000 feet throughout the experiment due to flight safety considerations.

*Meteorological visibility is defined as the maximum range at which a large object can be distinguished. This parameter has been used in POD/SAR Project experiments to be consistent with the National SAR Manual and to avoid using subjective measurements, such as effective visibility. When used in this report, "visibility" refers to "meteorological visibility."

**Significant wave height is approximately the height an experienced observer will give when estimating the height of waves at sea.

Search speed was maintained at maximum safe operating values for all three SRU types based upon the results of extensive previous visual detection research by the R&D Center.

1.3.2 Analysis of Visual Search Data

Two primary questions were addressed in the visual detection data analysis. They were:

1. Which of the primary search variables listed in section 1.3.1 had a significant influence on VDSO detectability?
2. What are the sweep width estimates for each SRU/VDSO combination tested and how do these compare with sweep widths for passive targets?

The influence of interactions among the primary search variables, unit type, lateral range, and other parameters of interest was investigated using a sophisticated binary, multivariate regression analysis technique (LOGODDS).

The linear logistic (LOGODDS) model was selected as an appropriate analysis tool for fitting POD/SAR Project visual search data where the dependent variable is binary (i.e., detection/no detection). The LOGODDS model is useful in quantifying the relationship between independent variables (x_i) and a probability of interest, R (in this case the probability of detecting a target). The independent variables (x_i) can be continuous (e.g., range,* search speed, wind speed) or binary (e.g., day/night, black/orange, SRU type 1 or 2). The LOGODDS model has been used with great success in previous POD/SAR Project visual search performance analyses. It was used in this analysis because of its proven analytical power and compatibility with previous POD/SAR Project data.

*In developing the $P(x)$ -versus-lateral range curve, the range, called lateral range, is determined by the closest point of approach that an SRU comes to a target of opportunity. Because the distance between SRU and target is not affected by the primary variables being investigated, it is considered independent.

The equation that the model uses for target detection probability is:

$$R = \frac{1}{1 + e^{-\lambda}}$$

where

$$\lambda = a_0 + a_1 x_1 + a_2 x_2 + a_3 x_3 \dots,$$

a_i = constants (determined by computer program), and

x_i = independent variable values.

The LOGODDS model has the following advantages over other candidate models/techniques.

1. The model implicitly contains the assumption that $0 \leq R \leq 1.0$. A linear model does not, unless the assumption is added to the model (and then computation can become very difficult).
2. The model is analogous to normal-theory linear models; therefore, analysis of variance and regression implications can be drawn from the model.
3. The model can be used to observe the effects of several independent or interactive parameters that are continuous or discrete.
4. A regression technique is better than non-parametric hypothesis testing, which does not yield quantitative relationships between the probability in question and the values of independent variables.

The primary disadvantages of the LOGODDS model are:

1. For the basic models, the dependent variable (R) must be a monotonic function of the independent variables.
2. The computational effort is substantial, requiring use of computer techniques.

Appendix A of reference 4 provides a more detailed description of the LOGODDS model.

Variables (in addition to lateral range) included in the LOGODDS data analysis for this experiment were those that had a significant influence on helicopter and surface vessel visual search performance in previous experiments (reference 2). These variables were:

1. Wind speed,
2. Significant wave height,
3. Time on task,
4. Meteorological visibility,
5. Cloud cover,
6. Target type,
7. Sun elevation, and
8. SRU type.

1.3.2.1 Development of Raw Data

During data reconstruction, detection and closest point of approach (CPA) ranges for each target opportunity were determined by referring to logs kept by the observer onboard each search and target unit and the MTS position/time plots. When the time, range, and relative bearing of a contact reported by the visual searchers agreed with the MTS plot and (in the case of the HHOS and HHRF signals that were not "on" continuously) the VDSO activation log, a target detection was recorded. Actual detection ranges were measured on the MTS plot directly from the search unit's trackline position

at the time of contact to the target position. CPA ranges were measured from the target to the nearest point on the search unit trackline. In the case of HHOS and HHRF signals, these CPA ranges were not necessarily measured as illustrated in figure 1-7 where lateral range was defined. Rather, the CPA or lateral range was the closest range that occurred between SRU and VDSD while the signal was active.

To establish a reasonable criterion for determining missed targets, a cutoff distance of 1.5 times the maximum sighting range achieved by each SRU type each day was selected. This cutoff distance provides sufficient data to identify the maximum target detection range (MDR) without adding a large number of meaningless (long-range) misses to the data base. Any target that was not recorded as a sighting, having a CPA (lateral) range less than or equal to 1.5 times the maximum sighting range of valid detections, was determined to be a "miss." An exception was made to this criterion when the computed cutoff distance for the day exceeded the longest conceivable visual horizon range for a given SRU/VDSD combination. In such cases, the horizon range was used as the limit for determining misses.

The lateral range and other explanatory variables for each target opportunity (detection or miss) were recorded in the same manner. Environmental conditions, target type, time on task, and other search parameters of interest were recorded along with a detection/miss indicator. A separate raw data file was developed for each SRU each search day that included all valid target sightings and all misses that met the above criterion. These data files were entered into a VAX 11/780 computer for analysis. Copies of these raw visual search data files are included in appendix A.

1.3.2.2 Validation of LOGODDS Model Fit

After the computer runs had been conducted to develop a LOGODDS model for each SRU/VDSD type, a "goodness of fit" test was performed to evaluate each model. Empirical data were binned by lateral range and other

significant parameters (e.g., time on task and wind speed) to compare, in a qualitative sense, the goodness of fit of the model to experimental data. As will be illustrated in chapter 2, these results were satisfactory. Also, a LOGODDS subroutine performed a Chi-squared test of the goodness of model fit to empirical data. The results of these tests indicated that the model with significant explanatory variables explained observed variation in $P(x)$ at the 0.01 level of significance.

In addition, Chi-squared tests were conducted to determine whether the LOGODDS model with only those variables determined to be significant could be improved upon by the addition of other explanatory variables. Chi-squared tests at a 0.01 level of significance did not indicate that a significantly better model fit would result by the addition of other explanatory variables.

The goodness of fit of the model to the empirical data was also checked through an analysis of residuals (residuals are defined as the difference between the model prediction of $P(x)$ and the outcome for each observation). Three different analyses of residuals were conducted.

1. The overall distribution of the residuals was checked for a near zero mean and normality.
2. Residuals were plotted with respect to each significant independent variable to check for systematic deviations from the model predictions.
3. Residuals were plotted with respect to predicted probabilities and aggregated to allow for analysis of variance.

After satisfactory lateral range curves were generated using the LOGODDS model, sweep widths for various combinations of significant parameters were calculated by numerical integration.

1.3.2.3 Other Analyses

Simpler analysis methods were used to investigate two issues that were not well-suited to the LOGODDS analysis technique.

The first issue of interest was to determine how well Coast Guard crewmembers were able to estimate the range to each type of VDS. It was noted during data reduction that the actual (measured) sighting ranges of detected targets were often substantially different than the estimated ranges reported to observers onboard the SRUs. Also, comments were made frequently during searches concerning the difficulty of estimating range to the strobes and red flares at night. To quantify these range estimation errors, the measured and estimated sighting ranges were entered into the computer data base for all target detections. A sorting program was then used to determine the minimum, maximum, mean, and standard deviation of the range estimate errors for each SRU/VDS combination evaluated.

The second issue investigated was whether the relative bearing of the sun had a significant influence on the detectability of HHOS. To investigate this question, all HHOS target opportunities were classified during data reduction as being predominantly up-, down-, or cross-sun from the SRU. A target was considered an up-sun opportunity if its position, as seen from the SRU, was within ± 15 degrees of the sun's relative bearing during most of the time the HHOS was active. Similarly, down-sun opportunities occurred within ± 15 degrees of 180 degrees bearing relative to the sun and the remaining opportunities were considered to be cross-sun. The HHOS data were sorted according to this classification scheme for helicopter and surface SRUs and the ratio of targets detected to total target opportunities was determined for each data subset. These statistics were analyzed using the F-test method for analysis of variance (one-way classification). This method, described fully in reference 5, chapter 15, tested the null hypothesis that the three ratios (in this case, proportions of targets detected in the up-, down-, and cross-sun situations) are not significantly different at the 90-percent confidence level. Separate tests were done for helicopter and surface SRUs.

Chapter 2

RESULTS

2.1 INTRODUCTION

The experiment yielded a total of 1703 target detection opportunities distributed among nine distinct SRU/VDS combinations as shown in table 2-1. Environmental conditions remained good to excellent during most of the data collection effort and, perhaps because of this, the analysis presented in this chapter does not identify many significant environmental influences on VDS target detection performance. The reader is cautioned that results discussed in this chapter should be interpreted assuming favorable weather conditions.

A particularly significant example of how a limited weather envelope influenced this SAR data analysis is the fact that wind speed was not identified as having a significant influence on HHOS detection. Although the 1984 R&D Center study of VDSs (reference 1) as well as common-sense expectations clearly lead one to expect significant reductions in HHOS sweep width as wind speed increases, the analysis presented here does not demonstrate this effect because all HHOS data were collected in wind speeds of 9 knots or less.

TABLE 2-1.
VDS SEARCH DATA QUANTITIES

SRU TYPE	VDS DETECTION OPPORTUNITIES		
	HHOS	HHRF	STROBE
41-FOOT UTB	50	278	309
82/95-FOOT WPB	117	211	27
HH-52A HELICOPTER	56	156	499

2.2 VISUAL SEARCH PERFORMANCE

Sections 2.2.1 through 2.2.3 discuss surface craft and helicopter performance in detecting each of the three VSDs evaluated during the experiment. Each of the three sections contains plots of the raw visual data and a corresponding LOGODDS regression fit to the data. Sections 2.2.4 and 2.2.5 present results of the sighting range estimation error and sun relative bearing analyses described in section 1.3.2.3. Finally, section 2.2.6 compares VSD sweep width values obtained from this experiment to corresponding estimates provided in the National SAR Manual (reference 6) and to sweep width values for passive targets that were computed using data collected during previous R&D Center experiments (reference 2).

2.2.1 Detection of HHOS Signals

Figures 2-1 through 2-3 illustrate the detection performance achieved by UTBs, WPBs, and helicopters when searching for HHOS. Analysis of the surface SRU data using the LOGODDS model indicated that the WPBs achieved significantly better detection performance than the UTBs. Figures 2-1 and 2-2 confirm this result. Figure 2-3 illustrates that HH-52A helicopters detected the orange smoke more effectively than the surface SRUs at lateral ranges beyond approximately 2 nautical miles, and almost as effectively as the surface SRUs at lateral ranges within 2 nautical miles.

The helicopters probably achieved better detection performance with the HHOS targets because better contrast existed between orange smoke and the water (helicopter view) as compared to the contrast between orange smoke and the sky (surface craft view).

SRU type and (for surface SRUs only) time on task were the only search parameters that demonstrated a statistically significant influence on HHOS detectability within the data set that was collected. Sweep width tables presented in section 2.2.6 quantify the time on task influence found in the analysis for surface SRUs.

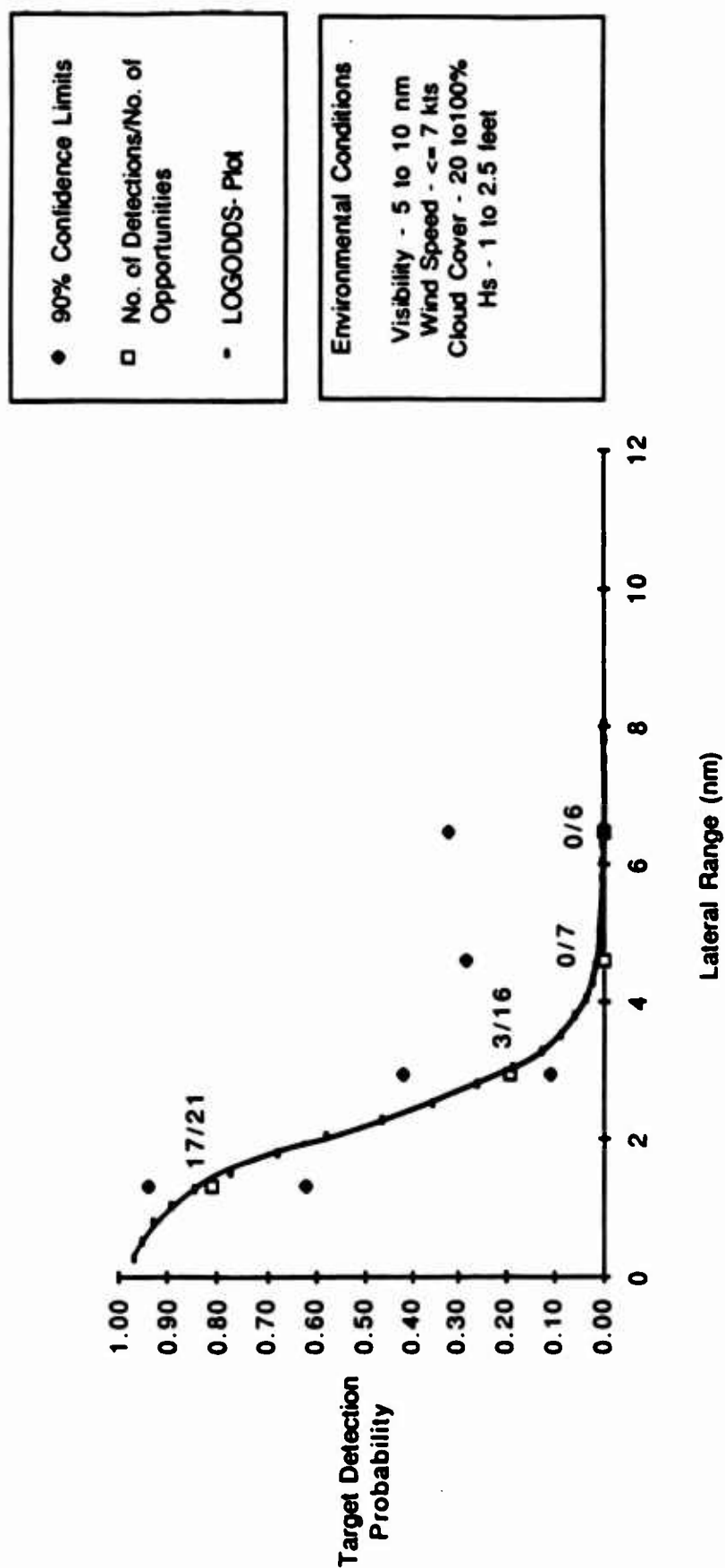


Figure 2-1. Target Detection Probability Versus Lateral Range:
41-Foot UTBs Searching for HHOS

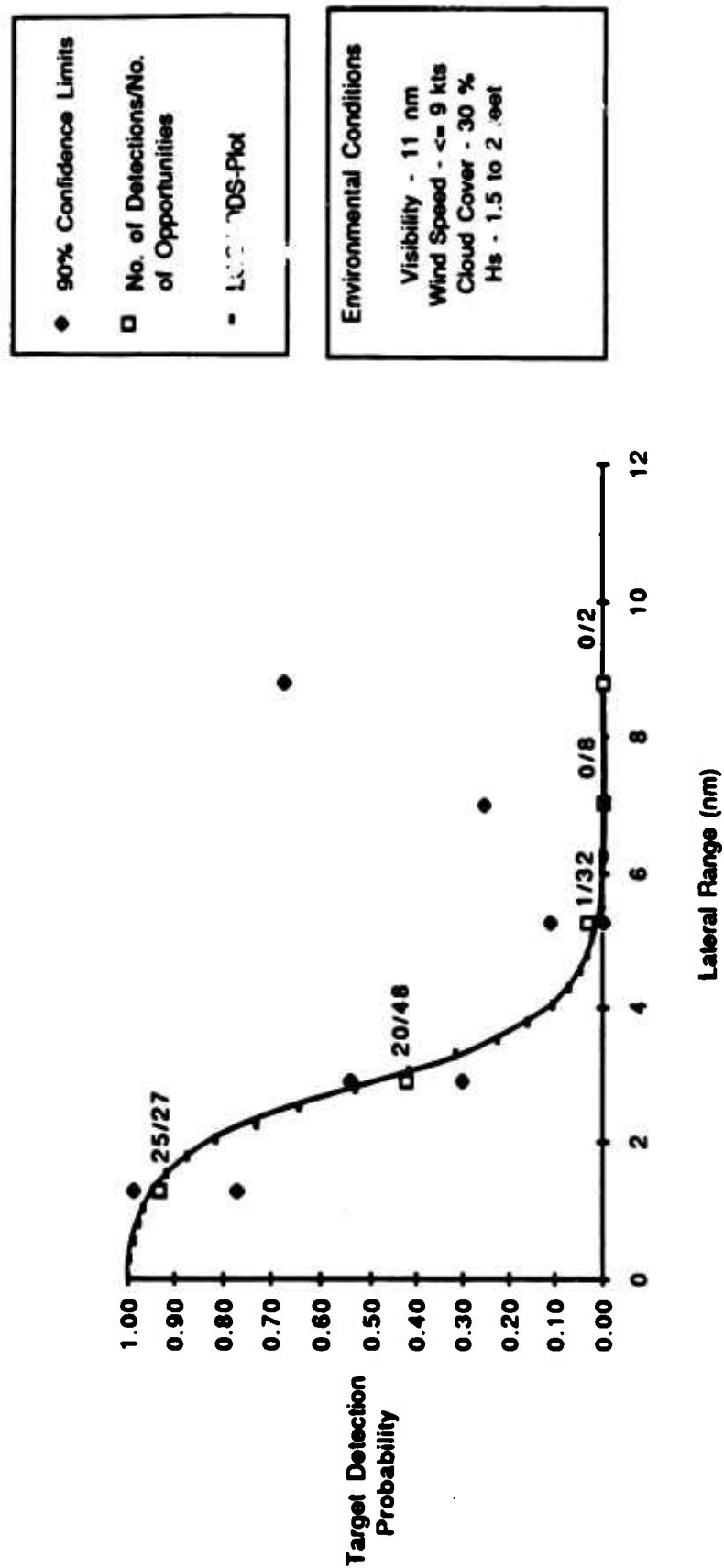
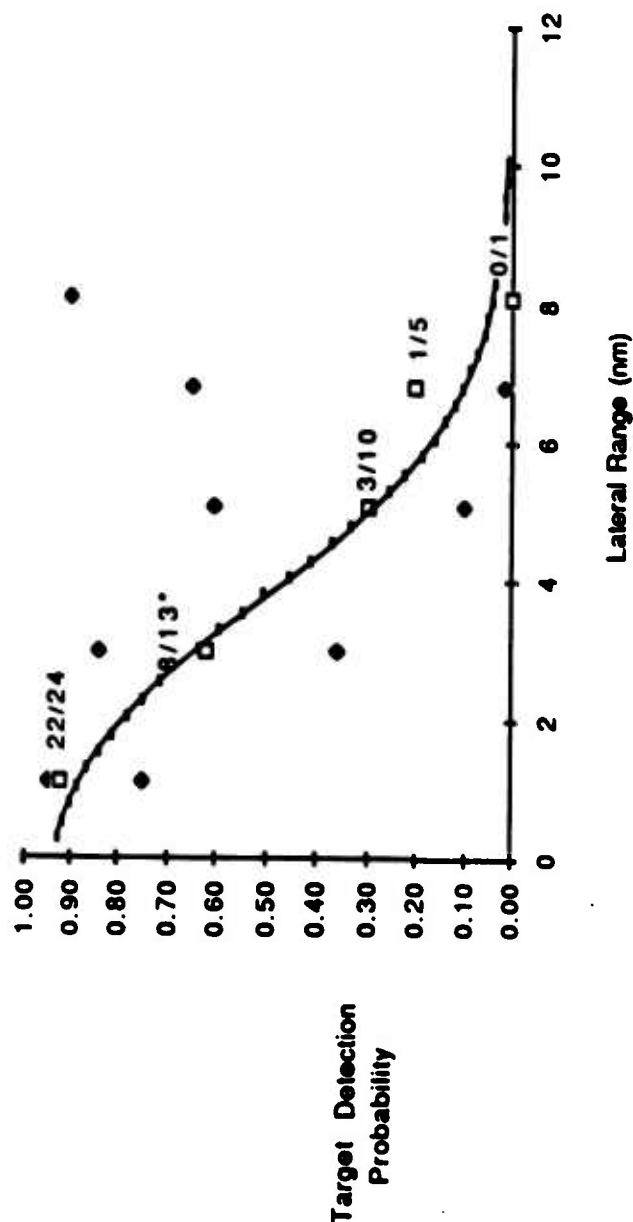
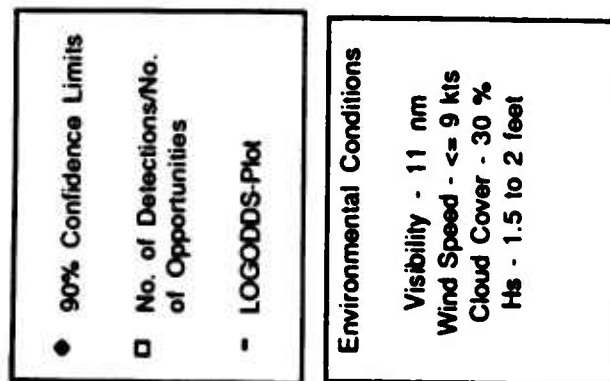


Figure 2-2. Target Detection Probability Versus Lateral Range:
82/95-Foot WPBs Searching for HH05



* An additional 3 target opportunities occurred under 5-nm visibility conditions in this range bin. None were detected.

Figure 2-3. Target Detection Probability Versus Lateral Range:
HH-52A Helicopters Searching for HHOS (1000-foot altitude)

2.2.2 Detection of HHRF Signals

Figures 2-4 through 2-6 illustrate the detection performance achieved by the UTBs, WPBs, and helicopters when searching for HHRF signals. As with the HHOS, LOGODDS analysis of the data indicated that the WPBs achieved significantly better detection performance than the UTBs. Comparison of figures 2-4 and 2-5 confirms this result.

Figure 2-6 demonstrates that the experiment did not provide sufficient data to identify the limits of lateral range at which HHRF signals can be detected by aircraft. Further, the scattered nature and small quantity of data for lateral ranges beyond 6 nautical miles suggests that the lateral range curve shown in figure 2-6 should be considered tentative pending additional data collection. It is likely, for example, that the curve will become very sensitive to visibility at the longer ranges (all data shown here were collected on clear nights), and that it will truncate at the ranges where survivors can spot search aircraft lights.

As with the HHOS data, SRU type and (for surface SRUs only) time on task were the only search parameters found to have a significant influence on HHRF detectability within the data set collected. Sweep width tables presented in section 2.2.6 will quantify the effects of these parameters on search performance.

2.2.3 Detection of Strobes

Figures 2-7 through 2-9 illustrate the detection performance achieved by UTBs, WPBs, and helicopters when searching for strobe-equipped PIW targets. It should be noted that the search performance achieved in this phase of the experiment was probably influenced by the circumstances under which data were collected. During the experiment, search area size was constrained by MTS coverage and SRU endurance. At the same time, up to 10 targets were available for deployment and a large data set was desired in the few days allocated for strobe evaluation. These factors resulted in a decision to collect strobe data in a high-target-density environment that would be

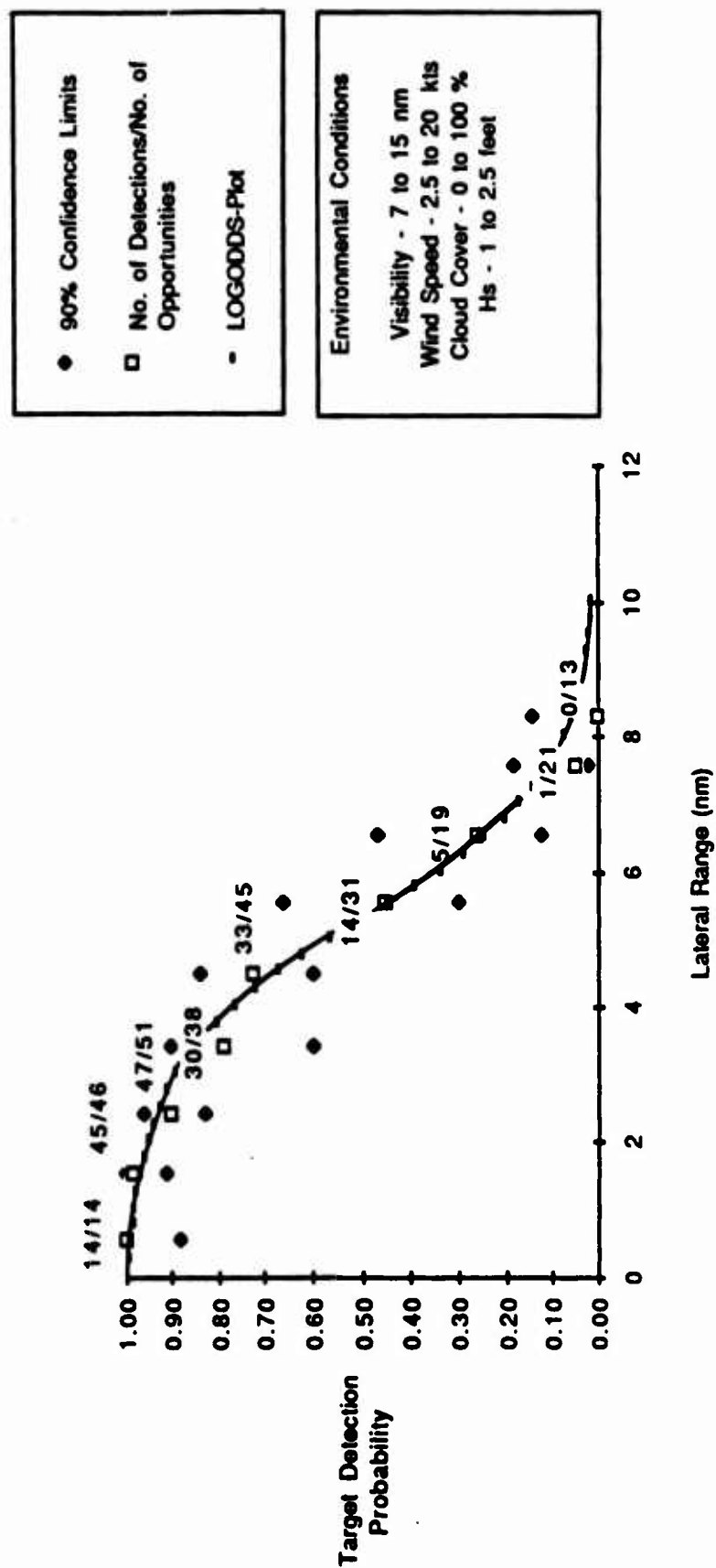


Figure 2-4. Target Detection Probability Versus Lateral Range:
41-Foot UTBs Searching for HHRF

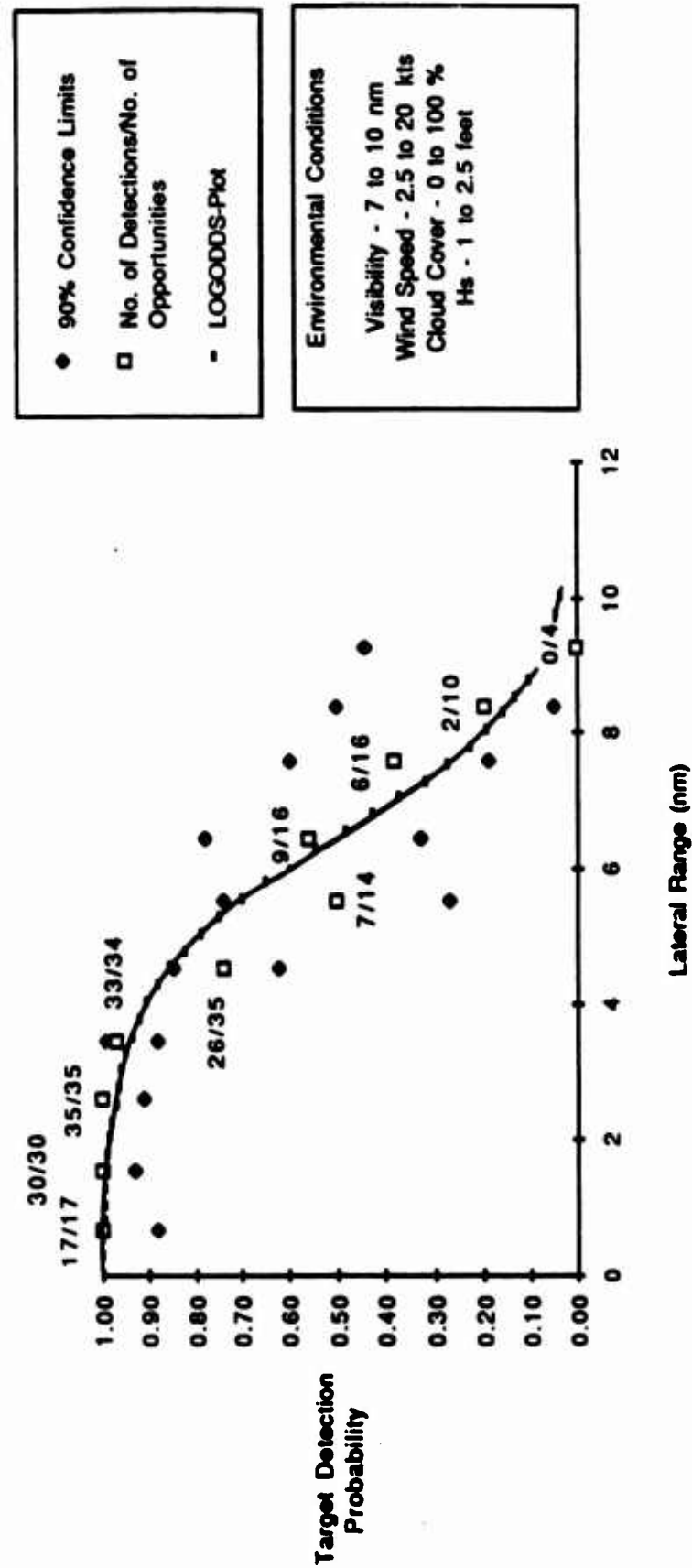


Figure 2-5. Target Detection Probability Versus Lateral Range:
82/95-Foot WPBs Searching for HHRF

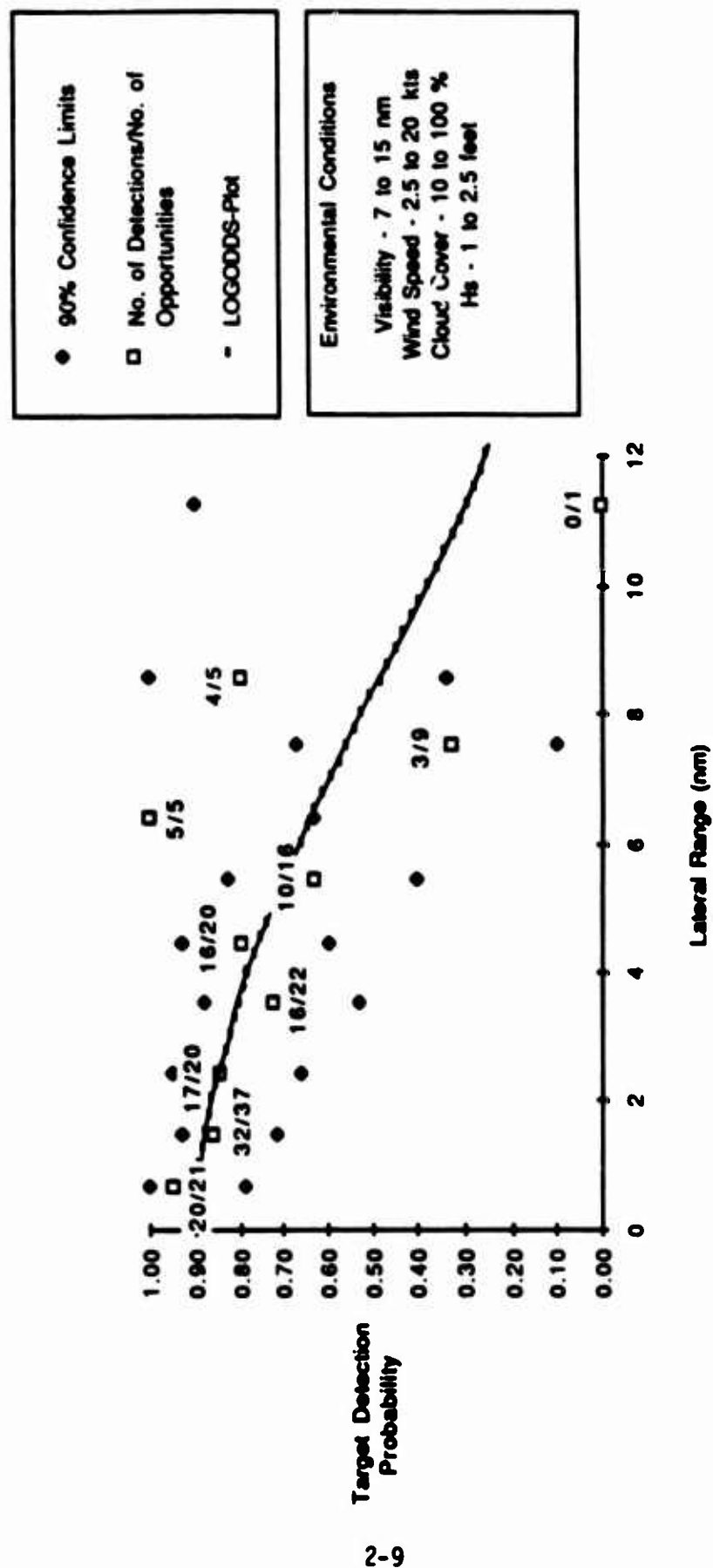


Figure 2-6. Target Detection Probability Versus Lateral Range:
 HH-52A Helicopters Searching for HHRF (1000-foot altitude)

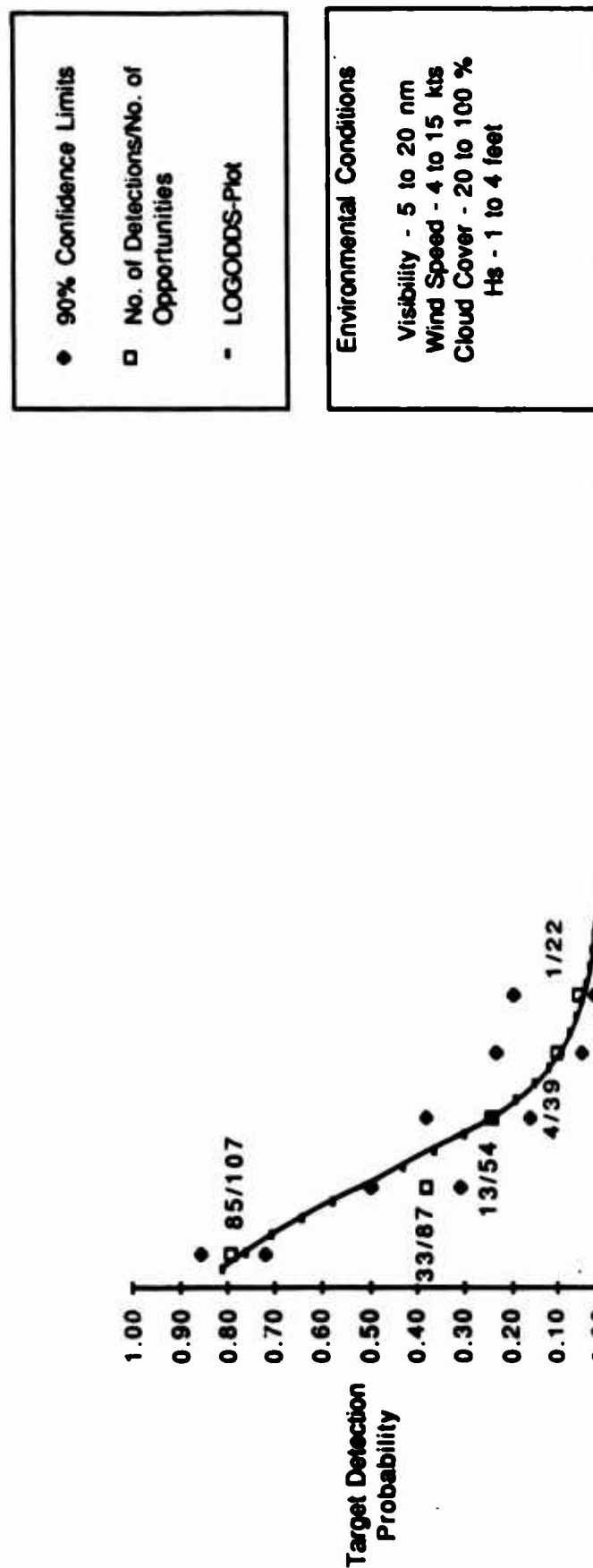


Figure 2-7. Target Detection Probability Versus Lateral Range:
 41-Foot UTBs Searching for Strobe



Figure 2-8. Target Detection Probability Versus Lateral Range:
82/95-Foot WPBs Searching for Strobe

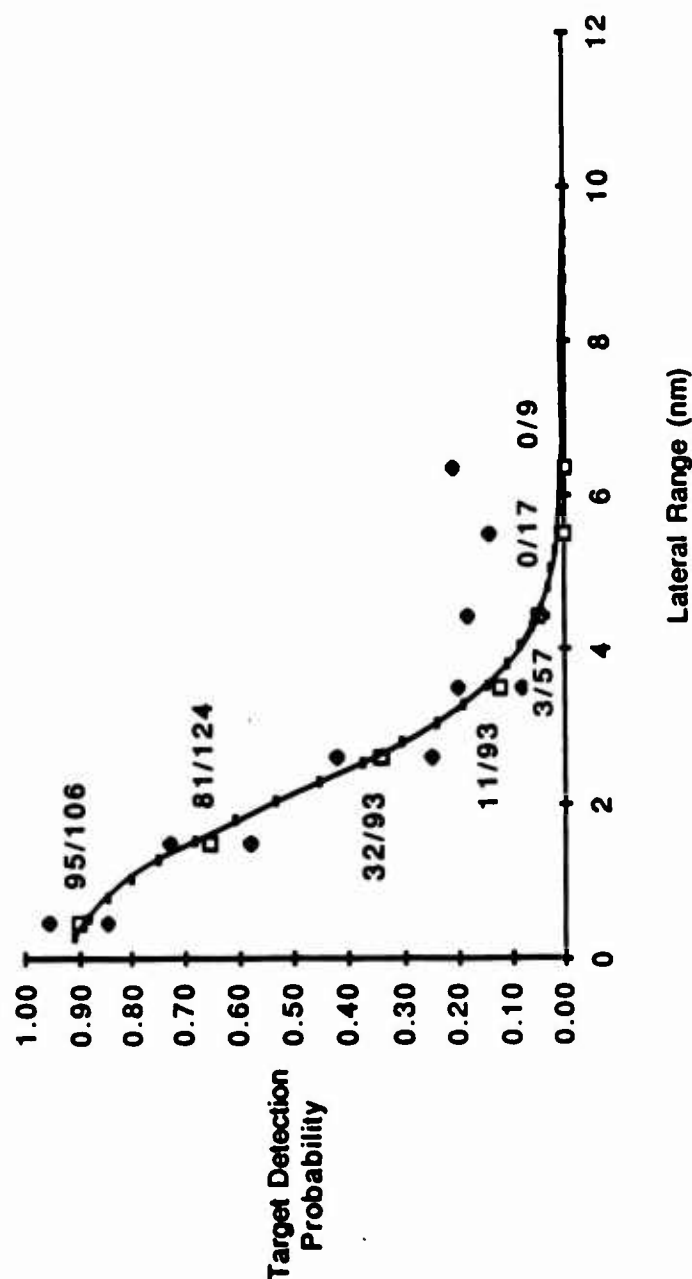
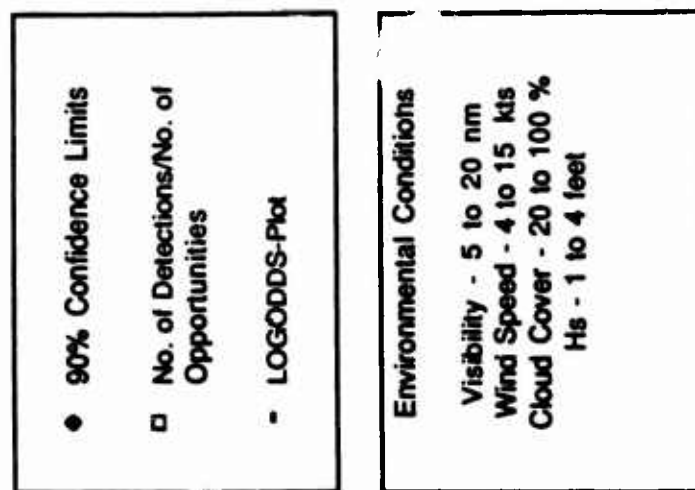


Figure 2-9. Target Detection Probability Versus Lateral Range:
HH-52A Helicopters Searching for Strobe (1000-foot altitude)

representative of an "abandon ship" scenario rather than a single, "man-overboard" situation. Therefore, a total of 8 to 10 strobes were seeded over areas ranging in size from 15 to 72 square nautical miles. In this environment, it was possible to overlook some strobes because of the distraction caused by detecting others. Further, it became evident during data reduction that multiple strobes occurring on the same line of bearing relative to an SRU were occasionally reported as a single target. The effect of these factors on the lateral range curves presented here was probably negative; thus, it is possible that the sweep widths reported in section 2.2.6 are conservative when applied to a less confused, single-target "man-overboard" situation.

The fitted lateral range curves illustrated in figures 2-7 and 2-8 for UTBs and WPBs are identical because no detection performance difference between the two SRU types was identified using the LOGODDs regression analysis model. This result is inconsistent with all previous POD/SAR project comparisons between UTB and WPB visual detection performance, and is very likely due to the fact that WPBs are severely under-represented in the strobe data set. While UTBs generated 307 strobe opportunities during the experiment, only 27 strobe opportunities were generated by a single WPB on one night of data collection. Figure 2-7 can be considered a high-confidence representation of UTB detection performance and figure 2-8 probably represents a lower limit on the detection performance than can be expected of WPBs.

Search parameters found to have a significant influence on strobe detection performance by the surface SRUs were time on task and wind speed. The negative influence of higher wind speed on search performance could be identified with the strobe targets because, unlike the HHOS and HHRF data, a sufficiently wide range of weather conditions are represented in the data set. The influence of time on task and wind speed on surface SRU sweep widths for strobes is quantified in section 2.2.6.

Figure 2-9 depicts the detection performance achieved by helicopters searching for strobes. Comparison of figure 2-9 with figures 2-7 and 2-8

indicates that the helicopters achieved slightly better detection probabilities than the surface SRUs at all lateral ranges, but that the maximum lateral ranges of detection were similar for both SRU types. This result suggests that the detection range for this type of VDS is limited more by luminous intensity than by line-of-sight limitations due to height-of-eye.

The only search parameter found to have a significant influence on helicopter/strobe sweep width was time on task. The reader will note that, of the three VDSs tested, only the strobes' detectability varied significantly with time on task during helicopter searches. This effect may have been due to the heavier target detection/reporting workload imposed on the aircrews during the strobe searches and/or the somewhat disorienting nature of the strobe signals.

Helicopter/strobe sweep widths are presented in section 2.2.6.

2.2.4 Sighting Range Estimation Errors

A quantitative comparison of actual versus reported target sighting range was performed for each of the three VDSs evaluated. This analysis was performed in response to subjective comments, made by experienced POD/SAR Project personnel, that the ranges reported by lookouts during night VDS searches appeared to be less accurate than the ranges reported during daytime searches.

To investigate this question quantitatively, the range estimation error was computed for each detected target as follows:

Range Estimation Error = Range Reported - Actual Target Range.

Thus, an underestimate was expressed as a negative number, and an overestimate was expressed as a positive number. These error data were sorted into 2-nautical-mile range bins (based on actual target range) to determine whether the errors varied with the distance from target to lookout.

The mean, standard deviation, and minimum and maximum range estimation errors were then computed and expressed as both absolute quantities and as percentages of the mean target range in each bin. Tables 2-2 through 2-4 summarize the results of this analysis.

Although the quantity of data presented in the three tables is somewhat difficult to digest, the following trends are noteworthy:

1. The absolute value of range estimation error tended to increase as distance to the target increased.
2. The mean range estimation error was always negative for ranges at or beyond 4 nautical miles; in other words, all SRUs tended to underestimate range as distance to the target increased.
3. At ranges less than 4 nautical miles, WPBs tended to overestimate target range, UTBs produced a mixture of positive and negative range estimation errors, and helicopters always underestimated target range.
4. In all nine SRU/VDSD combinations, the error always changed in the same direction (i.e., always grew more negative or more positive as the distance to the target increased).
5. As distance increased, the standard deviation (i.e., the "scatter") of range estimation errors expressed as a percent of target range generally diminished.
6. In 18 of 26 cases the means and standard deviations of range estimation error (expressed as percentages of target range) for the day-time HHOS searches were smaller than corresponding values obtained for the night HHRF and strobe searches.

TABLE 2-2
RANGE ESTIMATION ERROR STATISTICS - HHOS TARGETS

SRU TYPE	TARGET RANGE BIN (nm)	NO. OF TARGETS CONSIDERED	MEAN RANGE ESTIMATION ERROR (nm)	STANDARD DEVIATION OF ERRORS (nm)	MEAN TARGET RANGE IN BIN (nm)	MEAN/STANDARD DEVIATION OF ESTIMATE ERRORS EXPRESSED AS PERCENT OF MEAN TARGET RANGE	MAXIMUM RANGE UNDERESTIMATE (nm)	MAXIMUM RANGE OVERESTIMATE (nm)
41 - Foot UTB	ALL	20	-0.13	0.73	1.56	-08/48	-1.2	1.7
	0 to < 2	14	0.03	0.71	1.22	+02/56	-1.1	1.7
	2 to < 4	6	-0.48	0.69	2.35	-20/29	1.2	0.5
	4 to < 6	0	-	-	-	-	-	-
	6 to < 8	0	-	-	-	-	-	-
02/95 - Feet WPS	ALL	45	0.57	1.05	2.22	+26/47	-1.1	2.5
	0 to < 2	21	0.25	0.64	1.30	+19/49	-0.7	2.3
	2 to < 4	22	0.68	0.71	2.81	+24/25	1.1	2.5
	4 to < 6	2	0.55	-	4.95	not computed	none	0.9
	6 to < 8	0	-	-	-	-	-	-
HH-52A HELICOPTER	ALL	34	-0.44	0.68	2.55	-17/27	-1.8	1.1
	0 to < 2	16	-0.02	0.48	1.22	-02/39	-0.8	1.1
	2 to < 4	10	-0.87	0.50	2.82	-31/18	-1.8	none
	4 to < 6	7	-0.63	0.73	4.63	-14/16	-1.5	0.7
	6 to < 8	1	-	-	6.70	not computed	-1.7	none

TABLE 2-3
RANGE ESTIMATION ERROR STATISTICS - HHRF TARGETS

SRU TYPE	TARGET RANGE BIN (nm)	NO. OF TARGETS CONSIDERED	MEAN RANGE ESTIMATION ERROR (nm)	STANDARD DEVIATION OF ERRORS (nm)	MEAN TARGET RANGE IN BIN (nm)	MEAN/STANDARD DEVIATION OF ESTIMATE ERRORS EXPRESSED AS PERCENT OF MEAN TARGET RANGE	MAXIMUM RANGE UNDERESTIMATE (nm)	MAXIMUM RANGE OVERESTIMATE (nm)
41 - Foot UTB	ALL	188	-1.30	1.49	3.16	-41/47	-6.3	2.8
	0 to < 2	51	-0.14	0.69	1.37	-10/50	-1.5	2.0
	2 to < 4	78	-1.06	1.00	2.89	-37/35	-3.0	2.8
	4 to < 6	49	-2.21	1.41	4.75	-47/30	-4.6	1.1
	6 to < 8	10	-4.42	1.10	6.49	-68/17	-6.3	none
	8 to < 10	0						
82/95 - Foot WPB	ALL	165	-0.20	1.37	3.47	-06/39	-4.0	4.6
	0 to < 2	41	0.60	1.07	1.30	+48/82	-0.8	4.6
	2 to < 4	65	0.04	1.21	3.05	+01/40	-2.2	3.2
	4 to < 6	41	-0.77	1.34	4.68	-16/29	-3.1	2.9
	6 to < 8	15	-1.37	1.06	6.90	-20/15	-2.9	0.9
	8 to < 10	3	-2.30	1.75	8.63	not computed	-4.0	none
HH-52A HELICOPTER	ALL	119	-1.45	1.33	4.10	-35/32	-5.8	4.7
	0 to < 2	22	-0.34	0.40	1.37	-25/29	-0.9	0.4
	2 to < 4	38	-1.13	0.60	3.01	-38/20	-2.4	0.2
	4 to < 6	39	-1.51	1.41	4.84	-31/29	-3.6	4.7
	6 to < 8	10	-2.77	1.01	6.82	-41/15	-4.6	none
	8 to < 10	10	-3.63	1.16	8.63	-42/13	-5.8	-1.8

TABLE 2-4
RANGE ESTIMATION ERROR STATISTICS - STROBE TARGETS

SRU TYPE	TARGET RANGE BIN (nm)	NO. OF TARGETS CONSIDERED	MEAN RANGE ESTIMATION ERROR (nm)	STANDARD DEVIATION OF ERRORS (nm)	MEAN TARGET RANGE IN BIN (nm)	MEAN/STANDARD DEVIATION OF ESTIMATE ERRORS EXPRESSED AS PERCENT OF MEAN TARGET RANGE	MAXIMUM RANGE UNDERESTIMATE (nm)	MAXIMUM RANGE OVERESTIMATE (nm)
41 - Foot UTB	ALL	132	0.16	1.12	1.82	+09/62	-3.0	2.9
	0 to < 2	62	0.58	0.91	1.10	+53/63	-1.1	2.9
	2 to < 4	41	-0.40	1.06	2.73	-15/39	-2.4	1.6
	4 to < 6	9	-1.07	1.25	4.29	-25/29	-3.0	0.5
	6 to < 8	0	-	-	-	-	-	-
32/95 - Foot WPB	ALL	19	0.17	0.46	1.28	+13/36	-0.7	1.2
	0 to < 2	17	0.14	0.47	1.19	+12/39	-0.7	1.2
	2 to < 4	2	0.45	-	2.05	not computed	none	0.5
	4 to < 6	0	-	-	-	-	-	-
	6 to < 8	0	-	-	-	-	-	-
HH-52A HELICOPTER	ALL	211	-0.51	0.78	2.19	-23/36	-2.8	1.6
	0 to < 2	97	-0.17	0.52	1.33	-13/39	-1.3	1.4
	2 to < 4	102	-0.73	0.76	2.74	-27/28	-2.5	1.0
	4 to < 6	12	-1.38	1.26	4.54	-30/28	-2.8	1.6
	6 to < 8	0	-	-	-	-	-	-

The explanation for these trends is left to perceptual experts; however, it is operationally significant to Coast Guard SAR personnel that substantial errors in distance-to-target estimates can exist, and that these errors generally grow as target range increases.

2.2.5 Influence of Sun Relative Bearing on HHOS Detection

The HHOS search data were sorted as described in section 1.3.2.3 to determine whether target position relative to the sun influenced detectability. A target was considered an up-sun opportunity if its position, as seen from the SRU, was within ± 15 degrees of the sun's relative bearing during most of the time the HHOS was active. Similarly, down-sun opportunities occurred within ± 15 degrees of 180 degrees bearing relative to the sun and the remaining opportunities were considered to be cross-sun.

After sorting the surface and helicopter data sets into the three classifications, the mean values of potentially biasing search parameters (primarily lateral range, sun elevation, and cloud cover) for each group were compared subjectively. This procedure was used to verify that parameter values were similar enough across the data subsets so that an unbiased comparison of target detection performance could be made. No significant search parameter biases were found in either the surface SRU or the helicopter SRU data sets.

The sorted detection data are listed below:

SURFACE SRUs		
<u>Target Position</u>	<u>No. of Detections/ No. of Opportunities</u>	<u>Percent Detected</u>
up-sun	6/10	60
down-sun	8/22	36
cross-sun	53/135	39

HH-52A HELICOPTER

<u>Target Position</u>	<u>No. of Detections/ No. of Opportunites</u>	<u>Percent Detected</u>
up-sun	3/5	60
down-sun	6/8	75
cross-sun	25/43	58

Analyses of variance using the F-test at a 90-percent confidence level indicated that no statistically significant differences in the percentage of targets detected could be identified in either data set. The reader is cautioned, however, that the up-sun and down-sun groups of both data sets are small samples. Thus, one would expect only gross differences in detection performance to be identified as significant in a statistical test. Collection of additional data would be desirable to solidify the results of this analysis.

2.2.6 Sweep Width Comparisons

Sweep widths for all nine SRU/VDSD combinations were computed by integrating to find the area under the LOGODDS-generated lateral range curves, described in sections 2.2.1 through 2.2.3. Combinations of significant search parameters such as time on task, wind speed, and SRU type were selected to reflect actual conditions represented in the experiment data. Tables 2-5 through 2-8 compare sweep width values generated in this manner to appropriate sweep width values for passive targets taken from reference 2. Table 2-9 compares sweep width estimates listed for similar VDSDs in the National SAR Manual (reference 6) to those generated using the experiment data.

TABLE 2-5
COMPARISON OF SWEEP WIDTH VALUES (IN NAUTICAL MILES) FOR 41-FT UTBs AND 82/95-FT WPBS
SEARCHING FOR HHOS AND HHRF VERSUS WHITE 16-FT BOAT OR ORANGE CANOPIED LIFE RAFT

SRU TYPE	WHITE 16 - FT BOAT OR ORANGE CANOPIED LIFE RAFT		HAND HELD ORANGE SMOKE FLARE (HHOS)		WHITE 16 - FT BOAT OR ORANGE CANOPIED LIFE RAFT		HAND HELD RED FLARE (HHRF)	
	Time on Task (hr)		Time on Task (hr)		Time on Task (hr)		Time on Task (hr)	
	1	3	1	3	1	3	1	3
UTB	3.6	3.1	4.6	2.8	3.8	3.3	10.7	10.2
WPB	5.0	4.3	6.9	5.0	5.2	4.6	13.0	12.6

ASSUMED VALUES

Visibility (nm) : 10
 Wind Speed (knots) : <= 10
 Cloud Cover (tenths) : 0.5
 Sig. Wave Height (ft) : 1

**MEAN EXPERIMENT
CONDITIONS**

Visibility (nm) : 10.5
 Wind Speed (knots) : 4.6
 Cloud Cover (tenths) : 0.4
 Sig. Wave Height (ft) : 1.7

ASSUMED VALUES

Visibility (nm) : 10
 Wind Speed (knots) : <= 10
 Cloud Cover (tenths) : 0.0
 Sig. Wave Height (ft) : 1

**MEAN EXPERIMENT
CONDITIONS**

Visibility (nm) : 9.1
 Wind Speed (knots) : 6.2
 Cloud Cover (tenths) : 0.2
 Sig. Wave Height (ft) : 1.4

TABLE 2-6
COMPARISON OF SWEEP WIDTH VALUES (IN NAUTICAL MILES) FOR HELICOPTERS
SEARCHING FOR HHOS AND HHRF VERSUS WHITE 16-FT BOAT OR ORANGE CANOPIED LIFE RAFT

SRU TYPE	WHITE 16 - FT BOAT OR ORANGE CANOPIED LIFE RAFT	HAND HELD ORANGE SMOKE FLARE (HHOS)	HAND HELD RED FLARE (HHRF)
HH-52A	4.1	7.7	15.4

ASSUMED VALUES

Time on Task (hr) : 0 to 1
 Visibility (nm) : 10
 Wind Speed (knots) : <= 10
 Cloud Cover (tenths) : 0.5
 Sig. Wave Height (ft) : 1

MEAN EXPERIMENT
CONDITIONS

Time on Task (hr) : 0.8
 Visibility (nm) : 10.7
 Wind Speed (knots) : 5.4
 Cloud Cover (tenths) : 0.3
 Sig. Wave Height (ft) : 1.7

MEAN EXPERIMENT
CONDITIONS

Time on Task (hr) : 0.7
 Visibility (nm) : 9.5
 Wind Speed (knots) : 7.9
 Cloud Cover (tenths) : 0.3
 Sig. Wave Height (ft) : 1.8

TABLE 2-7
COMPARISON OF SWEEP WIDTH VALUES (IN NAUTICAL MILES) FOR 41-FT UTBs AND 82/95-FT WPBs
SEARCHING FOR STROBE VERSUS PIW

SRU TYPE	PIW			STROBE		
	Time on Task (hr)			Time on Task (hr)		
	1		3	1		3
	Wind Speed (kts)			Wind Speed (kts)		
	6	15	6	15	6	15
UTB	0.4	0.3	0.3	3.9	2.6	2.1
WPB	0.6	0.5	0.5	3.9	2.6	2.1
			0.4			1.1

MEAN EXPERIMENT
CONDITIONS

Cloud Cover (tenths) : 0.6

Sig. Wave Height (') : 2.4

ASSUMED VALUES

Cloud Cover (tenths) : 0.5

Sig. Wave Height (ft) : 1 (@Wind Speed = 6 kts)
2.5 (@Wind Speed = 15 kts)

TABLE 2-8
COMPARISON OF SWEEP WIDTH VALUES (IN NAUTICAL MILES) FOR HH-25A
HELICOPTERS SEARCHING FOR STROBE VERSUS PIW

SRU TYPE	PIW		STROBE	
	Time on Task (hr)		Time on Task (hr)	
	0.5	1.5	0.5	1.5
HH-52A	0.7	0.5	4.4	3.9

ASSUMED VALUES

Sig. Wave Height (ft): 0 to 1

Wind Speed (kts) : <= 10

MEAN EXPERIMENT
CONDITIONS

Sig. Wave Height (ft): 2

Wind Speed (kts): 8

TABLE 2-9
COMPARISON OF SAR MANUAL SWEEP WIDTHS FOR VDSOs WITH EXPERIMENT SWEEP
WIDTH PREDICTIONS (ALL SWEEP WIDTHS IN NAUTICAL MILES)

DEVICE	SAR MANUAL SWEEP WIDTH	41-FT UTB SWEEP WIDTH	82/95 -FT WPB SWEEP WIDTH	HELICOPTER SWEEP WIDTH
HHOS	5.0	2.8 to 4.6	5.0 to 6.9	7.7
HHRF	8.0	10.2 to 10.7	12.6 to 13.0	15.4
STROBE	10.0	1.1 to 3.9	1.1 to 3.9	3.9 to 4.4

Note : SAR manual sweep widths apply to all search units and assume good visibility. The HHOS sweep width assumes light winds.

2.2.6.1 Surface SRUs: HHOS and HHRF Targets

Table 2-5 compares UTB and WPB sweep widths for HHOS and HHRF signals to corresponding sweep widths for 16-foot white boats and 4- to 6-person orange canopied life rafts. Table 2-5 shows that, for wind speeds of less than 10 knots, orange smoke sweep widths are similar to or slightly greater than those for the passive targets. This result leads one to expect that HHOS used on larger target craft or in higher winds would not enhance sweep width, but would only aid in identifying distressed craft. In contrast, the sweep widths given for HHRF signals show that, if it is known that flares are available, night search sweep widths can be nearly triple those for daytime small-craft searches.

2.2.6.2 Helicopter SRUs: HHOS and HHRF Targets

Table 2-6 compares helicopter sweep widths for HHOS and HHRF signals to those for small boats and life rafts. In this case, orange smoke provides nearly double the sweep width that can be expected for the passive targets alone in clear, calm weather. As mentioned earlier, this is likely due to the high contrast between orange smoke and the water as viewed from the air. The HHRF sweep width computed for night helicopter searches is more than triple that for a daytime search for small, passive targets.

2.2.6.3 Surface SRUs: Strobe Targets

Table 2-7 compares UTB and WPB sweep widths for strobes with corresponding sweep widths for passive, person-in-water (PIW) targets. Table 2-7 indicates that, at night, strobes provide a 3- to 10-fold improvement over sweep widths achieved during daytime searches for PIWs. It is likely that in less favorable visibility/sea state conditions, the advantage provided by the strobes would diminish. Additional data collection would be required to quantify this effect. The reader will also recall that due to a shortfall in WPB/strobe search data, the WPB sweep widths listed here are the same as

those given for UTBs. Based on prior comparisons of WPB and UTB visual search performance, it is expected that WPB/strobe sweep widths are actually larger than those given in table 2-7.

2.2.6.4 Helicopter SRUs: Strobe Targets

Table 2-8 compares helicopter sweep widths for strobes with those for helicopter/PIW searches. As with the surface SRUs, helicopter sweep widths for night strobe searches are nearly an order of magnitude greater than sweep widths for daytime PIW searches.

2.2.6.5 Comparison to SAR Manual Sweep Widths

Table 2-9 compares the VDSO sweep width values obtained from experiment data to corresponding sweep widths provided in the National SAR Manual (reference 6). The SAR Manual cautions that the values it provides are only estimates, and that better information should be used when available. Sweep widths obtained during the experiment indicate that the accuracy of the SAR Manual estimates varies a great deal with SRU and VDSO type.

The sweep width provided for HHOS is in closest agreement with the experiment data, being about right for surface SRUs and about 50 percent too low for helicopter SRUs. The SAR Manual sweep width estimate for HHRF signals is about 30 to 60 percent low for surface SRUs and only about half the sweep width computed for helicopter SRUs.

The SAR Manual sweep width estimate of 10 nautical miles for life jacket (PFD) strobes appears to be extremely optimistic for the conditions under which data were collected during this experiment. The reader will recall that the experiment data were collected in a high-target-density, near-shore environment. These conditions impose a heavy but realistic workload on SRU crews, and they may differ from conditions assumed in the SAR Manual.

Another difference between the experiment and SAR Manual assumptions existed in that the "man-overboard" or life-ring type strobe used for this evaluation was larger and more powerful than some PFD strobes. Even with this larger strobe, sweep widths obtained during the experiment were only about 11 to 44 percent of the value given in the SAR Manual. Previous R&D Center tests (reference 1) indicated that sweep widths for one brand of PFD strobe may be much smaller than those computed for the model tested during this experiment.

Chapter 3

CONCLUSIONS AND RECOMMENDATIONS

3.1 CONCLUSIONS

The following conclusions are based on the analyses presented in chapter 2.

3.1.1 Detection of HHOS Signals

1. In clear, calm weather, sweep widths for daytime HHOS searches conducted by surface SRUs are similar to sweep widths for small, high-contrast passive targets such as 16-foot white boats and 4- to 6-person orange canopied life rafts.
2. The sweep width for daytime HHOS searches conducted in clear, calm weather by helicopter SRUs is about twice the sweep width for small, high-contrast passive targets.
3. In searches conducted by surface SRUs, HHOS appears to function more as an aid to distinguish distressed craft from others than as an aid to target detection. In searches by helicopters, both functions are served.
4. Surface SRU sweep widths for HHOS are about the same as the 5-nautical-mile value provided in the National SAR Manual (table 3-1). Helicopter sweep widths are about 1.5 times this value (table 3-1).
5. The bearing of the sun relative to an HHOS signal does not appear to have a significant effect on its detectability by surface or air SRUs.

TABLE 3-1
SWEEP WIDTH VALUES (IN NAUTICAL MILES) FOR 41-FOOT UTBs
82/95-FOOT WPBs, AND HH-52As SEARCHING FOR HHOS DISTRESS SIGNALS
DURING DAYLIGHT HOURS

SRU TYPE	Time on Task (hr)		Environmental Conditions Represented			
	1	3	Visibility (nm)	Wind Speed (knots)	Cloud Cover (percent)	Sig. Wave Height (ft)
UTB	4.6	2.8	5 to 10	<= 7	20 to 100	1 to 2.5
WPB	6.9	5.0	11	<= 9	30	1.5 to 2
HH-52A	7.7		11	<= 9	30	1.5 to 2

3.1.2 Detection of HHRF Signals

1. In clear weather, the sweep widths for nighttime HHRF searches conducted by surface SRUs can be* nearly triple the sweep widths for daytime searches for small, high-contrast passive targets.
2. In clear weather, sweep width for nighttime HHRF searches conducted by helicopter SRUs can be* more than triple the sweep width for daytime searches for small, high-contrast passive targets.
3. Surface SRU sweep widths for HHRF signals are 30 to 60 percent larger than the 8 nautical mile value in the National SAR Manual (table 3-2). The sweep width for helicopter SRUs is nearly double the National SAR Manual value (table 3-2).

*Operational HHRF sweep widths may be less than these amounts due to limitations in the survivor's ability to see and identify search craft.

TABLE 3-2
SWEEP WIDTH VALUES (IN NAUTICAL MILES) FOR 41-FOOT UTBs,
82/95-FOOT WPBs and HH-52As SEARCHING FOR HHRF DISTRESS SIGNALS
AT NIGHT

SRU TYPE	Time on Task (hr)		Environmental Conditions Represented			
	1	3	Visibility (nm)	Wind Speed (knots)	Cloud Cover (percent)	Sig. Wave Height (ft)
UTB	10.7	10.2	7 to 15	2.5 to 20	0 to 100	1 to 2.5
WPB	13.0	12.6	7 to 10	2.5 to 20	0 to 100	1 to 2.5
HH-52A	15.4		7 to 15	2.5 to 20	10 to 100	1 to 2.5

3.1.3 Detection of Strokes

1. In clear weather, sweep widths for night searches for life-ring type strobes conducted by surface and helicopter SRUs are 3 to 10 times greater than sweep widths for daytime PIW searches.
2. Surface and helicopter SRU sweep widths for life-ring strobes are only 11 to 44 percent as large as the 10-nautical-mile value provided for life jacket strobes in the National SAR Manual (tables 3-3 and 3-4).

TABLE 3-3
SWEEP WIDTH VALUES (IN NAUTICAL MILES) FOR 41-FOOT UTBs AND
82/95-FOOT WPBs SEARCHING FOR WHITE STROBE AT NIGHT

SRU TYPE	Time on Task (hr)				Environmental Conditions Represented			
	1		3		Visiblility (nm)	Wind Speed (knots)	Cloud Cover (percent)	Sig. Wave Height (ft)
	Wind Speed (kts)							
	6	15	6	15				
UTB	3.9	2.6	2.1	1.1	5 to 20	4 to 15	20 to 100	1 to 4
WPB	3.9	2.6	2.1	1.1	5	15	100	3 to 4

TABLE 3-4
SWEEP WIDTH VALUES (IN NAUTICAL MILES) FOR HH-52As SEARCHING FOR
WHITE STROBE AT NIGHT

SRU TYPE	Time on Task (hr)		Environmental Conditions Represented			
	0.5	1.5	Visiblility (nm)	Wind Speed (knots)	Cloud Cover (percent)	Sig. Wave Height (ft)
HH-52A	4.4	3.9	5 to 20	4 to 15	20 to 100	1 to 4

3.1.4 General

1. VDSD target range estimates provided by lookouts onboard SRUs are subject to substantial errors and scatter, especially at night. The magnitude of the errors grows with target range.

3.2 RECOMMENDATIONS

The following recommendations are made concerning VDSD search planning and procedures based on the results of this experiment. Recommendations for future VDSD research are also provided.

3.2.1 Search Planning Procedures

1. The sweep width values presented in this report for HHOS (table 3-1), HHRF (table 3-2), and strobe (tables 3-3 and 3-4) VDSDs should be used by Coast Guard search planners, where applicable, in lieu of the estimates provided in the National SAR Manual.
2. SRUs should use every available means to make themselves visible and identifiable to distressed craft when VDSD may be available. VDSD sweep widths presented in this report include an implicit assumption that the distressed vessel is able to detect the SRU and signal in response to its presence.
3. Search crews, especially those onboard aircraft should pay extra attention to the task of maintaining, to the extent possible, a full 360-degree scan during VDSD searches. The nature of the target/SRU interaction may result in a VDSD being activated only after the SRU has passed the distressed craft's position. A second chance may not occur.

4. SRUs should be aware that range estimates involving VSDs are subject to substantial error, especially at night, with greater errors generally occurring for targets at greater ranges.

3.2.2 Future VSD Research

1. Evaluations of other common VSDs should be conducted to develop sweep width estimates. The methodology described in this report yielded satisfactory data, and is recommended for future VSD evaluations.
2. Additional strobe search data should be obtained using WPB-class SRUs so that better sweep width estimates can be developed.
3. Additional data should be collected for helicopter/HHRF searches to better define the lateral range curve beyond 6 nautical miles. Revised sweep width estimates should be developed based on the additional data.
4. Data should be collected using fixed-wing aircraft SRUs to develop VSD sweep widths. No such data are currently available, and there is reason to believe that, due to their higher search speeds, fixed-wing SRUs may not achieve sweep widths as large as those for helicopters.

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APPENDIX A

RAW DATA

This appendix contains raw data files for the VSD tests in chronological order by device type. The following is a key to the format of the raw data files. A -99 in any column indicates that the information is unavailable or not applicable.

1. Cutter/boat searching during the day for HHOS:

- Column 1: Detection (1 = yes, 0 = no)
- Column 2: Lateral Range (nautical miles)
- Column 3: Time on Task (hours)
- Column 4: Meteorological visibility (nautical miles)
- Column 5: Wind speed (knots)
- Column 6: Cloud cover (tenths)
- Column 7: Significant wave height (feet)
- Column 8: Search Speed (knots)
- Column 9: Sun elevation (degrees)
- Column 10: Target type

- 1 = Hand-held orange smoke flare (HHOS)
- 3 = Hand-held red flare (HHRF)
- 5 = Strobe

Column 11: Sighting range (nautical miles)

Column 12: Relative bearing of the sun

0 = Up-sun

1 = Down-sun

2 = Cross-sun

2. Helicopters searching during the day for HHOS:

Column 1: Detection (1 = yes, 0 = no)

Column 2: Lateral Range (nautical miles)

Column 3: Time on Task (hours)

Column 4: Meteorological visibility (nautical miles)

Column 5: Wind speed (knots)

Column 6: Cloud cover (tenths)

Column 7: Significant wave height (feet)

Column 8: Search Speed (knots)

Column 9: Altitude (feet)

Column 10: Sun elevation (degrees)

Column 11: Target type

1 = Hand-held orange smoke flare (HHOS)

3 = Hand-held red flare (HHRF)

5 = Strobe

Column 12: Sighting range (nautical miles)

Column 13: Relative bearing of the sun

0 = Up-sun

1 = Down-sun

2 = Cross-sun

3. Cutter/boat searching at night for HHRF and Strobes:

Column 1: Detection (1 = yes, 0 = no)

Column 2: Lateral Range (nautical miles)

Column 3: Time on Task (hours)

Column 4: Meteorological visibility (nautical miles)

Column 5: Wind speed (knots)

Column 6: Cloud cover (tenths)

Column 7: Significant wave height (feet)

Column 8: Search Speed (knots)

Column 9: Target type

1 = Hand-held orange smoke flare (HHOS)

3 = Hand-held red flare (HHRF)

5 = Strobe

Column 10: Sighting range (nautical miles)

4. Helicopters searching at night for HHRF and Strobes:

Column 1: Detection (1 = yes, 0 = no)

Column 2: Lateral Range (nautical miles)

Column 3: Time on Task (hours)

Column 4: Meteorological visibility (nautical miles)

Column 5: Wind speed (knots)

Column 6: Cloud cover (tenths)

Column 7: Significant wave height (feet)

Column 8: Search Speed (knots)

Column 9: Altitude (feet)

Column 10: Target type

1 = Hand-held orange smoke flare (HHOS)

3 = Hand-held red flare (HHRF)

5 = Strobe

Column 11: Sighting range (nautical miles)

41476	15 APRIL 86	HHOS	7.00	1.00	15.00	58.00	1.00	-99.00	2.00
0	2.40	1.00	6.00	1.00	15.00	58.00	1.00	-99.00	2.00
1	1.60	2.30	9.00	0.80	15.00	46.00	1.00	1.70	2.00
0	2.00	2.30	9.00	0.80	15.00	48.00	1.00	-99.00	2.00
0	2.10	2.40	8.00	0.80	15.00	45.00	1.00	-99.00	2.00

HH-52A 1389	15 APRIL 86	HHOS	8.00	1.00	90.00	1000.00	60.00	1.00	-99.00	2.00
0	2.40	0.80	5.00	1.00	90.00	1000.00	60.00	1.00	-99.00	2.00
0	2.70	1.20	5.00	1.00	90.00	1000.00	60.00	1.00	-99.00	2.00
0	2.70	1.40	5.00	1.00	90.00	1000.00	59.00	1.00	-99.00	2.00

41476	17 APRIL 86	HHOS	3.00	1.00	15.00	60.00	1.00	1.10	1.00
1	1.10	0.20	5.00	1.00	15.00	60.00	1.00	1.10	1.00
1	0.60	0.90	1.00	1.00	15.00	61.00	1.00	0.60	2.00

42048	17 APRIL 86	HHOS	3.00	1.00	15.00	60.00	1.00	-99.00	1.00
0	1.60	0.70	5.00	1.00	15.00	60.00	1.00	-99.00	1.00
0	2.90	0.60	5.00	1.00	15.00	60.00	1.00	-99.00	2.00

42048	26 APRIL 86	HHOS	4.00	0.90	2.00	15.00	62.00	1.00	-99.00	2.00
0	4.10	0.80	4.00	0.90	2.00	15.00	62.00	1.00	-99.00	2.00
1	1.30	1.00	4.00	0.90	2.00	15.00	62.00	1.00	1.40	2.00
0	5.70	1.50	4.00	0.90	2.00	15.00	64.00	1.00	-99.00	2.00
0	4.00	1.60	1.00	0.90	2.00	15.00	64.00	1.00	-99.00	2.00
1	1.60	1.80	4.00	0.90	2.00	15.00	63.00	1.00	1.60	2.00
1	1.30	0.00	4.00	0.90	2.00	15.00	57.00	1.00	1.30	2.00
1	3.60	0.50	4.00	0.90	2.00	15.00	60.00	1.00	3.60	2.00
1	1.40	0.60	4.00	0.90	2.00	15.00	61.00	1.00	1.70	2.00
0	4.30	1.10	4.00	0.90	2.00	15.00	62.00	1.00	-99.00	2.00
1	2.00	1.60	4.00	0.90	2.00	15.00	64.00	1.00	2.00	2.00

41334	26 APRIL 86	HHOS	4.00	0.90	2.00	15.00	61.00	1.00	-99.00	2.00
0	2.00	0.10	4.00	0.90	2.00	15.00	61.00	1.00	-99.00	2.00
1	1.30	0.60	4.00	0.90	2.00	15.00	63.00	1.00	1.30	2.00
0	6.60	0.50	4.00	0.90	2.00	15.00	62.00	1.00	-99.00	1.00
0	5.30	0.60	4.00	0.90	2.00	15.00	63.00	1.00	-99.00	1.00

PT BATAM	8 MAY 86	HHOS	2.00	0.30	2.00	15.00	61.00	1.00	-99.00	2.00
0	4.40	1.30	2.00	0.30	2.00	15.00	61.00	1.00	-99.00	2.00
0	2.70	1.50	2.00	0.30	2.00	15.00	62.00	1.00	-99.00	2.00
1	1.10	1.60	2.00	0.30	2.00	15.00	63.00	1.00	1.60	2.00
1	0.60	1.60	2.00	0.30	2.00	15.00	63.00	1.00	0.60	2.00
1	3.00	0.20	2.00	0.30	2.00	15.00	50.00	1.00	3.10	1.00
0	3.00	0.30	2.00	0.30	2.00	15.00	52.00	1.00	-99.00	2.00
1	3.60	0.40	2.00	0.30	2.00	15.00	53.00	1.00	3.80	2.00
0	6.10	0.70	2.00	0.30	2.00	15.00	56.00	1.00	-99.00	2.00
1	3.10	1.00	2.00	0.30	2.00	15.00	58.00	1.00	3.60	2.00

1	2.40	1.10	11.00	2.00	0.30	2.00	2.00	15.00	59.00	1.00	2.50	2.00
1	1.00	1.10	11.00	2.00	0.30	2.00	2.00	15.00	60.00	1.00	1.20	2.00
1	0.80	1.30	11.00	2.00	0.30	2.00	2.00	15.00	61.00	1.00	0.80	2.00
0	4.70	1.90	11.00	2.00	0.30	2.00	2.00	15.00	66.00	1.00	-99.00	2.00
0	6.80	0.20	11.00	2.00	0.30	2.00	2.00	15.00	52.00	1.00	-99.00	1.00
0	6.00	0.30	11.00	2.00	0.30	2.00	2.00	15.00	52.00	1.00	-99.00	1.00
0	5.10	2.10	11.00	2.00	0.30	2.00	2.00	15.00	66.00	1.00	-99.00	2.00
1	4.00	0.80	11.00	2.00	0.30	2.00	2.00	15.00	57.00	1.00	4.10	2.00
0	2.10	0.90	11.00	2.00	0.30	2.00	2.00	15.00	58.00	1.00	-99.00	2.00
0	7.70	1.50	11.00	2.00	0.30	2.00	2.00	15.00	62.00	1.00	-99.70	2.00
0	7.60	1.60	11.00	2.00	0.30	2.00	2.00	15.00	64.00	1.00	-99.00	2.00
0	7.10	1.70	11.00	2.00	0.30	2.00	2.00	15.00	64.00	1.00	-99.00	2.00
0	5.00	1.80	11.00	2.00	0.30	2.00	2.00	15.00	65.00	1.00	-99.00	2.00
1	3.60	1.90	11.00	2.00	0.30	2.00	2.00	15.00	65.00	1.00	3.60	2.00
1	2.80	2.00	11.00	2.00	0.30	2.00	2.00	15.00	66.00	1.00	3.00	2.00
1	1.60	2.10	11.00	2.00	0.30	2.00	2.00	15.00	66.00	1.00	1.80	2.00
1	0.90	2.10	11.00	2.00	0.30	2.00	2.00	15.00	66.00	1.00	1.00	2.00
1	2.10	1.00	11.00	2.00	0.30	2.00	2.00	15.00	58.00	1.00	2.20	1.00
0	4.20	3.20	11.00	6.00	0.30	1.50	1.50	15.00	67.00	1.00	-99.00	2.00
1	2.10	3.40	11.00	6.00	0.30	1.50	1.50	15.00	66.00	1.00	2.70	0.00
1	1.30	3.50	11.00	6.00	0.30	1.50	1.50	15.00	65.00	1.00	1.80	0.00
0	3.20	3.80	11.00	8.50	0.30	1.50	1.50	15.00	64.00	1.00	-99.00	2.00
0	5.60	4.00	11.00	8.50	0.30	1.50	1.50	15.00	63.00	1.00	-99.00	2.00
0	5.20	4.20	11.00	8.50	0.30	1.50	1.50	15.00	61.00	1.00	-99.00	2.00
0	4.60	4.30	11.00	8.50	0.30	1.50	1.50	15.00	62.00	1.00	-99.00	2.00
0	1.70	4.50	11.00	8.50	0.30	1.50	1.50	15.00	58.00	1.00	-99.00	1.00
1	1.70	4.30	11.00	8.50	0.30	1.50	1.50	15.00	59.00	1.00	1.70	2.00
0	5.80	2.40	11.00	2.00	0.30	1.50	1.50	15.00	67.00	1.00	-99.00	0.00
0	5.10	2.60	11.00	2.00	0.30	1.50	1.50	15.00	68.00	1.00	-99.00	2.00
0	3.70	2.80	11.00	6.00	0.30	1.50	1.50	15.00	68.00	1.00	-99.00	2.00
0	2.60	2.90	11.00	6.00	0.30	1.50	1.50	15.00	68.00	1.00	-99.00	2.00
0	2.40	3.00	11.00	6.00	0.30	1.50	1.50	15.00	67.00	1.00	-99.00	2.00
0	3.00	3.10	11.00	6.00	0.30	1.50	1.50	15.00	67.00	1.00	-99.00	0.00
0	4.60	3.50	11.00	6.00	0.30	1.50	1.50	15.00	66.00	1.00	-99.00	2.00
0	2.90	3.60	11.00	8.50	0.30	1.50	1.50	15.00	65.00	1.00	-99.00	2.00
1	2.10	3.70	11.00	8.50	0.30	1.50	1.50	15.00	65.00	1.00	2.20	2.00
1	1.80	4.00	11.00	8.50	0.30	1.50	1.50	15.00	62.00	1.00	1.90	2.00
0	2.50	4.10	11.00	8.50	0.30	1.50	1.50	15.00	62.00	1.00	-99.00	2.00
0	2.90	4.20	11.00	8.50	0.30	1.50	1.50	15.00	60.00	1.00	-99.00	1.00
1	1.40	2.30	11.00	6.00	0.30	1.50	1.50	15.00	66.00	1.00	1.40	2.00

1	2.40	2.50	11.00	6.00	0.30	1.50	15.00	67.00	1.00	2.50	2.00
0	3.40	4.30	11.00	8.50	0.30	1.50	15.00	63.00	1.00	-99.00	2.00
0	5.20	2.90	11.00	6.00	0.30	1.50	15.00	68.00	1.00	-99.00	2.00
0	3.80	3.00	11.00	6.00	0.30	1.50	15.00	67.00	1.00	-99.00	2.00
0	2.60	3.10	11.00	6.00	0.30	1.50	15.00	67.00	1.00	-99.00	2.00
0	1.50	3.20	11.00	6.00	0.30	1.50	15.00	66.00	1.00	-99.00	1.00
1	1.20	3.30	11.00	6.00	0.30	1.50	15.00	66.00	1.00	1.20	2.00

CAPE STARR 8 MAY 86 HHOS

0	2.20	0.60	11.00	2.00	0.30	2.00	15.00	57.00	1.00	-99.00	2.00
1	0.50	0.70	11.00	2.00	0.30	2.00	15.00	58.00	1.00	0.90	2.00
0	4.00	1.10	11.00	2.00	0.30	2.00	15.00	61.00	1.00	-99.00	2.00
0	6.80	0.10	11.00	2.00	0.30	2.00	15.00	52.00	1.00	-99.00	2.00
1	5.50	0.20	11.00	2.00	0.30	2.00	15.00	53.00	1.00	5.80	2.00
1	3.50	0.40	11.00	2.00	0.30	2.00	15.00	54.00	1.00	3.50	0.00
1	3.30	0.40	11.00	2.00	0.30	2.00	15.00	54.00	1.00	3.30	0.00
1	3.20	0.50	11.00	2.00	0.30	2.00	15.00	55.00	1.00	3.20	2.00
0	3.40	0.80	11.00	2.00	0.30	2.00	15.00	59.00	1.00	-99.00	2.00
0	3.30	0.80	11.00	2.00	0.30	2.00	15.00	59.00	1.00	-99.00	2.00
1	2.50	0.90	11.00	2.00	0.30	2.00	15.00	60.00	1.00	2.70	2.00
1	0.60	1.10	11.00	2.00	0.30	2.00	15.00	61.00	1.00	0.80	2.00
1	2.00	1.90	11.00	2.00	0.30	2.00	15.00	66.00	1.00	2.10	2.00
1	3.00	1.90	11.00	2.00	0.30	2.00	15.00	66.00	1.00	3.20	2.00
1	1.60	2.00	11.00	2.00	0.30	2.00	15.00	67.00	1.00	1.70	2.00
1	2.00	1.10	11.00	2.00	0.30	1.50	15.00	67.00	1.00	2.10	1.00
1	2.60	0.00	11.00	2.00	0.30	2.00	15.00	51.00	1.00	2.80	2.00
0	8.40	2.00	11.00	2.00	0.30	2.00	15.00	67.00	1.00	-99.00	2.00
1	1.30	0.10	11.00	2.00	0.30	2.00	15.00	52.00	1.00	1.40	0.00
0	7.60	0.70	11.00	2.00	0.30	2.00	15.00	58.00	1.00	-99.00	2.00
0	3.70	1.20	11.00	2.00	0.30	2.00	15.00	62.00	1.00	-99.00	1.00
1	3.10	1.30	11.00	2.00	0.30	2.00	15.00	62.00	1.00	3.10	1.00
0	2.30	1.40	11.00	2.00	0.30	2.00	15.00	63.00	1.00	-99.00	2.00
1	2.30	1.50	11.00	2.00	0.30	2.00	15.00	64.00	1.00	2.40	2.00
0	5.50	1.60	11.00	2.00	0.30	2.00	15.00	65.00	1.00	-99.00	2.00

1	1.00	0.40	11.00	2.00	0.30	2.00	90.00	1000.00	64.00	1.00	1.30	2.00
0	3.50	0.70	11.00	2.00	0.30	2.00	90.00	1000.00	66.00	1.00	-99.00	2.00
1	0.20	0.90	11.00	2.00	0.30	2.00	90.00	1000.00	66.00	1.00	1.80	2.00
0	1.90	0.60	11.00	2.00	0.30	2.00	90.00	1000.00	65.00	1.00	-99.00	2.00
1	1.00	0.80	11.00	2.00	0.30	2.00	90.00	1000.00	66.00	1.00	1.00	2.00
1	1.30	0.50	11.00	2.00	0.30	2.00	90.00	1000.00	65.00	1.00	1.40	2.00
1	3.40	0.60	11.00	2.00	0.30	2.00	90.00	1000.00	65.00	1.00	4.00	1.00
1	1.50	0.70	11.00	2.00	0.30	2.00	90.00	1000.00	65.00	1.00	1.90	2.00
0	4.80	0.90	11.00	2.00	0.30	2.00	90.00	1000.00	67.00	1.00	-99.00	2.00
1	1.10	1.00	11.00	2.00	0.30	1.50	90.00	1000.00	67.00	1.00	1.10	2.00
0	8.10	1.00	11.00	2.00	0.30	1.50	90.00	1000.00	67.10	1.00	-99.00	1.00
0	1.80	1.10	11.00	2.00	0.30	1.50	90.00	1000.00	67.00	1.00	-99.00	2.00
1	3.80	1.20	11.00	2.00	0.30	1.50	90.00	1000.00	67.00	1.00	3.80	2.00
1	0.20	1.40	11.00	6.00	0.30	1.50	90.00	1000.00	68.00	1.00	0.30	2.00
1	4.40	1.40	11.00	6.00	0.30	1.50	90.00	1000.00	68.00	1.00	4.90	2.00
1	1.00	1.60	11.00	6.00	0.30	1.50	90.00	1000.00	67.00	1.00	1.10	2.00
0	2.30	1.50	11.00	6.00	0.30	1.50	90.00	1000.00	67.00	1.00	-99.00	1.00
0	4.90	1.60	11.00	6.00	0.30	1.50	90.00	1000.00	67.00	1.00	-99.00	2.00
0	6.20	0.20	11.00	2.00	0.30	2.00	90.00	1000.00	62.00	1.00	-99.00	2.00
0	5.20	0.90	11.00	2.00	0.30	2.00	90.00	1000.00	66.00	1.00	-99.00	2.00
0	7.80	0.90	11.00	2.00	0.30	2.00	90.00	1000.00	66.00	1.00	-99.00	2.00
1	1.70	1.40	11.00	6.00	0.30	1.50	90.00	1000.00	68.00	1.00	-99.00	0.00
0	2.80	1.50	11.00	6.00	0.30	1.50	90.00	1000.00	67.00	1.00	-99.00	0.00

41335 22 APRIL 86 STROBE

1	0.70	0.10	5.00	15.00	1.00	3.50	15.00	5.00	0.70	1.00		
1	0.30	0.10	5.00	15.00	1.00	3.50	15.00	5.00	1.00	1.00		
1	0.70	0.10	5.00	15.00	1.00	3.50	15.00	5.00	0.80	1.00		
1	0.10	0.10	5.00	15.00	1.00	3.50	15.00	5.00	0.80	1.00		
1	0.90	0.20	5.00	15.00	1.00	3.50	15.00	5.00	0.90	1.00		
1	0.00	0.20	5.00	15.00	1.00	3.50	15.00	5.00	1.00	1.00		
1	0.70	0.30	5.00	15.00	1.00	3.50	15.00	5.00	1.10	1.00		
1	0.60	0.60	5.00	15.00	1.00	3.50	15.00	5.00	2.00	1.00		
1	0.00	0.60	5.00	15.00	1.00	3.50	15.00	5.00	0.30	1.00		

1	0.40	0.90	5.00	15.00	1.00	3.50	15.00	5.00	1.40
1	1.00	1.30	5.00	15.00	1.00	3.50	15.00	5.00	1.00
1	0.50	1.30	5.00	15.00	1.00	3.50	15.00	5.00	1.20
1	0.80	1.30	5.00	15.00	1.00	3.50	15.00	5.00	0.80
1	0.40	1.30	5.00	15.00	1.00	3.50	15.00	5.00	0.70
1	0.80	1.40	5.00	15.00	1.00	3.50	15.00	5.00	0.80
0	1.10	0.10	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	1.10	0.20	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	0.40	0.80	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	0.80	0.90	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	0.60	0.80	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	0.70	0.90	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	1.00	0.90	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	0.60	0.70	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	0.30	1.30	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	0.40	1.40	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	0.40	1.50	5.00	15.00	1.00	3.50	15.00	5.00	-99.00

41310	22 APRIL 86	STROME	5.00	15.00	1.00	3.50	15.00	5.00	0.50
1	0.40	0.10	5.00	15.00	1.00	3.50	15.00	5.00	0.40
1	0.20	0.20	5.00	15.00	1.00	3.50	15.00	5.00	0.90
1	0.50	0.30	5.00	15.00	1.00	3.50	15.00	5.00	1.10
1	1.00	0.50	5.00	15.00	1.00	3.50	15.00	5.00	1.40
1	1.30	0.70	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	0.60	0.20	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	1.50	0.20	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	1.80	0.10	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	2.20	0.20	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	1.30	0.30	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	3.90	0.50	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	2.40	0.50	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	3.10	0.50	5.00	15.00	1.00	3.50	15.00	5.00	-99.00

41344	22 APRIL 86	STROME	15.00	1.00	3.50	15.00	5.00	1.30
1	1.30	0.00	5.00	1.00	3.50	15.00	5.00	1.30
1	0.00	0.00	5.00	1.00	3.50	15.00	5.00	1.20
1	0.40	0.10	5.00	1.00	3.50	15.00	5.00	0.70
1	0.50	0.10	5.00	1.00	3.50	15.00	5.00	1.40
1	0.70	0.20	5.00	1.00	3.50	15.00	5.00	1.90
1	1.40	0.20	5.00	1.00	3.50	15.00	5.00	2.40
1	1.80	0.30	5.00	1.00	3.50	15.00	5.00	1.90
1	1.90	0.30	5.00	1.00	3.50	15.00	5.00	2.10
1	0.00	0.50	5.00	1.00	3.50	15.00	5.00	0.60
1	1.00	0.50	5.00	1.00	3.50	15.00	5.00	1.30
1	1.40	0.50	5.00	1.00	3.50	15.00	5.00	1.40
1	0.80	0.70	5.00	1.00	3.50	15.00	5.00	1.00
1	0.20	0.60	5.00	1.00	3.50	15.00	5.00	0.40
1	1.20	0.70	5.00	1.00	3.50	15.00	5.00	1.40
1	0.70	0.80	5.00	1.00	3.50	15.00	5.00	1.10
1	0.50	0.80	5.00	1.00	3.50	15.00	5.00	1.30
1	0.50	0.80	5.00	1.00	3.50	15.00	5.00	1.10
1	0.80	0.80	5.00	1.00	3.50	15.00	5.00	1.70
1	0.30	0.90	5.00	1.00	3.50	15.00	5.00	1.30
1	0.40	0.90	5.00	1.00	3.50	15.00	5.00	1.50
1	0.10	1.10	5.00	1.00	3.50	15.00	5.00	2.60
1	0.30	1.20	5.00	1.00	3.50	15.00	5.00	1.00
1	1.30	1.50	5.00	1.00	3.50	15.00	5.00	1.30
1	0.10	1.30	5.00	1.00	3.50	15.00	5.00	1.70
1	0.20	1.50	5.00	1.00	3.50	15.00	5.00	1.50
1	0.70	1.60	5.00	1.00	3.50	15.00	5.00	1.70
0	1.60	0.20	5.00	1.00	3.50	15.00	5.00	-99.00
0	1.80	0.10	5.00	1.00	3.50	15.00	5.00	-99.00
0	1.30	0.70	5.00	1.00	3.50	15.00	5.00	-99.00
0	0.40	0.80	5.00	1.00	3.50	15.00	5.00	-99.00
0	1.10	0.90	5.00	1.00	3.50	15.00	5.00	-99.00
0	1.00	1.30	5.00	1.00	3.50	15.00	5.00	-99.00
0	1.60	1.40	5.00	1.00	3.50	15.00	5.00	-99.00
0	1.30	1.40	5.00	1.00	3.50	15.00	5.00	-99.00
0	0.80	1.50	5.00	1.00	3.50	15.00	5.00	-99.00

0	1.70	1.50	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	2.10	1.50	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	1.50	1.60	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	1.40	1.70	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	2.40	0.30	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	0.50	0.60	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	1.90	0.70	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	3.10	0.70	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	0.80	1.20	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	2.00	1.50	5.00	15.00	1.00	3.50	15.00	5.00	-99.00

41334	22 APRIL 86	STROME							
1	1.50	0.10	5.00	15.00	1.00	3.50	15.00	5.00	1.50
1	1.80	0.20	5.00	15.00	1.00	3.50	15.00	5.00	2.80
1	1.20	0.20	5.00	15.00	1.00	3.50	15.00	5.00	1.30
1	2.40	0.20	5.00	15.00	1.00	3.50	15.00	5.00	2.50
0	1.10	0.10	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	2.60	0.10	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	3.00	0.10	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	1.40	0.20	5.00	15.00	1.00	3.50	15.00	5.00	-99.00
0	2.40	0.20	5.00	15.00	1.00	3.50	15.00	5.00	-99.00

PT. BATAM	22 APRIL 86	STROME							
1	0.80	0.00	5.00	15.00	1.00	3.50	14.00	5.00	1.20
1	0.20	0.10	5.00	15.00	1.00	3.50	14.00	5.00	1.20
1	0.40	0.10	5.00	15.00	1.00	3.50	14.00	5.00	1.80
1	0.10	0.20	5.00	15.00	1.00	3.50	14.00	5.00	0.80
1	0.60	0.30	5.00	15.00	1.00	3.50	14.00	5.00	1.20
1	0.30	0.50	5.00	15.00	1.00	3.50	14.00	5.00	0.70
1	1.20	0.50	5.00	15.00	1.00	3.50	14.00	5.00	1.20

1	0.20	0.50	5.00	15.00	1.00	3.50	14.00	5.00	1.00
1	0.50	0.60	5.00	15.00	1.00	3.50	14.00	5.00	1.30
1	0.10	0.60	5.00	15.00	1.00	3.50	14.00	5.00	1.10
1	0.20	0.70	5.00	15.00	1.00	3.50	14.00	5.00	0.90
1	0.30	0.90	5.00	15.00	1.00	3.50	14.00	5.00	0.60
1	0.90	0.90	5.00	15.00	1.00	3.50	14.00	5.00	1.70
1	0.60	0.90	5.00	15.00	1.00	3.50	14.00	5.00	1.70
1	0.30	0.90	5.00	15.00	1.00	3.50	14.00	5.00	2.00
1	0.70	1.00	5.00	15.00	1.00	3.50	14.00	5.00	1.60
1	0.60	1.10	5.00	15.00	1.00	3.50	14.00	5.00	1.10
1	1.10	1.10	5.00	15.00	1.00	3.50	14.00	5.00	2.10
1	0.50	1.10	5.00	15.00	1.00	3.50	14.00	5.00	1.10
0	1.30	0.80	5.00	15.00	1.00	3.50	14.00	5.00	-99.00
0	1.70	0.80	5.00	15.00	1.00	3.50	14.00	5.00	-99.00
0	1.60	0.70	5.00	15.00	1.00	3.50	14.00	5.00	-99.00
0	1.20	1.10	5.00	15.00	1.00	3.50	14.00	5.00	-99.00
0	1.70	0.20	5.00	15.00	1.00	3.50	14.00	5.00	-99.00
0	2.10	0.20	5.00	15.00	1.00	3.50	14.00	5.00	-99.00
0	1.50	0.20	5.00	15.00	1.00	3.50	14.00	5.00	-99.00
0	1.30	0.30	5.00	15.00	1.00	3.50	14.00	5.00	-99.00

HM-52A 1463		22 APRIL 86		STROME						
1	0.50	0.00	5.00	15.00	1.00	3.50	85.00	700.00	5.00	1.70
1	0.10	0.00	5.00	15.00	1.00	3.50	85.00	700.00	5.00	1.00
1	0.10	0.00	5.00	15.00	1.00	3.50	85.00	700.00	5.00	1.80
1	1.10	0.00	5.00	15.00	1.00	3.50	85.00	700.00	5.00	1.20
1	0.80	0.00	5.00	15.00	1.00	3.50	85.00	700.00	5.00	1.60
1	0.90	0.10	5.00	15.00	1.00	3.50	85.00	700.00	5.00	1.60
1	0.10	0.10	5.00	15.00	1.00	3.50	85.00	700.00	5.00	1.20
1	0.10	0.10	5.00	15.00	1.00	3.50	85.00	700.00	5.00	2.50
1	1.30	0.10	5.00	15.00	1.00	3.50	85.00	700.00	5.00	1.80
1	1.20	0.10	5.00	15.00	1.00	3.50	85.00	700.00	5.00	1.60
1	1.40	0.10	5.00	15.00	1.00	3.50	85.00	700.00	5.00	2.30
1	0.00	0.10	5.00	15.00	1.00	3.50	85.00	700.00	5.00	1.90
1	0.80	0.10	5.00	15.00	1.00	3.50	85.00	700.00	5.00	1.70

1	2.80	0.20	5.00	15.00	1.00	3.50	85.00	650.00	5.00	2.80
1	2.50	0.20	5.00	15.00	1.00	3.50	85.00	650.00	5.00	2.50
1	1.10	0.20	5.00	15.00	1.00	3.50	85.00	650.00	5.00	2.10
1	0.80	0.20	5.00	15.00	1.00	3.50	85.00	650.00	5.00	1.70
1	2.80	0.30	5.00	15.00	1.00	3.50	85.00	650.00	5.00	2.90
1	2.80	0.30	5.00	15.00	1.00	3.50	85.00	650.00	5.00	2.80
1	2.00	0.30	5.00	15.00	1.00	3.50	85.00	650.00	5.00	2.10
0	1.50	0.30	5.00	15.00	1.00	3.50	85.00	650.00	5.00	-99.00
0	1.20	0.30	5.00	15.00	1.00	3.50	85.00	650.00	5.00	-99.00
0	1.50	0.30	5.00	15.00	1.00	3.50	85.00	650.00	5.00	-99.00
0	0.90	0.30	5.00	15.00	1.00	3.50	85.00	650.00	5.00	-99.00
1	0.50	0.40	5.00	15.00	1.00	3.50	85.00	650.00	5.00	1.40
1	2.10	0.40	5.00	15.00	1.00	3.50	85.00	650.00	5.00	2.10
1	1.70	0.40	5.00	15.00	1.00	3.50	85.00	650.00	5.00	2.20
1	0.30	0.40	5.00	15.00	1.00	3.50	85.00	650.00	5.00	1.70
1	1.50	0.40	5.00	15.00	1.00	3.50	85.00	650.00	5.00	1.60
1	0.90	0.40	5.00	15.00	1.00	3.50	85.00	650.00	5.00	0.90
0	1.60	0.20	5.00	15.00	1.00	3.50	85.00	650.00	5.00	-99.00
0	1.90	0.20	5.00	15.00	1.00	3.50	85.00	650.00	5.00	-99.00
0	3.40	0.20	5.00	15.00	1.00	3.50	85.00	650.00	5.00	-99.00
0	2.30	0.20	5.00	15.00	1.00	3.50	85.00	650.00	5.00	-99.00
0	3.20	0.20	5.00	15.00	1.00	3.50	85.00	650.00	5.00	-99.00
0	3.60	0.20	5.00	15.00	1.00	3.50	85.00	650.00	5.00	-99.00
0	3.20	0.50	5.00	15.00	1.00	3.50	85.00	650.00	5.00	-99.00
0	3.80	0.50	5.00	15.00	1.00	3.50	85.00	650.00	5.00	-99.00
0	2.60	0.50	5.00	15.00	1.00	3.50	85.00	650.00	5.00	-99.00
0	2.80	0.50	5.00	15.00	1.00	3.50	85.00	650.00	5.00	-99.00
0	3.80	0.50	5.00	15.00	1.00	3.50	85.00	650.00	5.00	-99.00
0	2.60	0.50	5.00	15.00	1.00	3.50	85.00	650.00	5.00	-99.00
0	4.00	0.50	5.00	15.00	1.00	3.50	85.00	650.00	5.00	-99.00
0	4.30	0.50	5.00	15.00	1.00	3.50	85.00	650.00	5.00	-99.00
0	3.10	0.50	5.00	15.00	1.00	3.50	85.00	650.00	5.00	-99.00
1	0.20	0.80	5.00	15.00	1.00	3.50	80.00	700.00	5.00	2.40
1	1.80	0.80	5.00	15.00	1.00	3.50	80.00	700.00	5.00	2.50
1	2.00	0.90	5.00	15.00	1.00	3.50	80.00	700.00	5.00	2.60
1	1.30	0.90	5.00	15.00	1.00	3.50	80.00	700.00	5.00	1.80
1	1.20	0.90	5.00	15.00	1.00	3.50	80.00	700.00	5.00	1.50
1	3.20	0.90	5.00	15.00	1.00	3.50	80.00	700.00	5.00	3.20
1	0.30	0.90	5.00	15.00	1.00	3.50	80.00	700.00	5.00	1.70

1	1.10	0.90	5.00	15.00	1.00	3.50	80.00	700.00	5.00	1.80
1	1.10	0.90	5.00	15.00	1.00	3.50	80.00	700.00	5.00	1.40
1	0.90	1.00	5.00	15.00	1.00	3.50	80.00	700.00	5.00	1.20
1	0.50	1.00	5.00	15.00	1.00	3.50	80.00	700.00	5.00	1.70
1	0.40	1.00	5.00	15.00	1.00	3.50	80.00	700.00	5.00	0.50
1	1.00	1.00	5.00	15.00	1.00	3.50	80.00	700.00	5.00	1.00
1	0.00	1.10	5.00	15.00	1.00	3.50	80.00	700.00	5.00	0.90
1	0.80	1.10	5.00	15.00	1.00	3.50	80.00	700.00	5.00	1.70
1	2.60	1.10	5.00	15.00	1.00	3.50	80.00	700.00	5.00	2.60
1	1.90	1.20	5.00	15.00	1.00	3.50	80.00	700.00	5.00	2.20
1	2.80	1.20	5.00	15.00	1.00	3.50	80.00	700.00	5.00	2.80
0	3.00	0.80	5.00	15.00	1.00	3.50	80.00	700.00	5.00	-99.00
0	2.90	0.80	5.00	15.00	1.00	3.50	80.00	700.00	5.00	-99.00
0	3.00	0.80	5.00	15.00	1.00	3.50	80.00	700.00	5.00	-99.00
0	3.70	0.80	5.00	15.00	1.00	3.50	80.00	700.00	5.00	-99.00
0	3.80	0.80	5.00	15.00	1.00	3.50	80.00	700.00	5.00	-99.00
0	4.50	0.80	5.00	15.00	1.00	3.50	80.00	700.00	5.00	-99.00
0	1.70	0.80	5.00	15.00	1.00	3.50	80.00	700.00	5.00	-99.00
0	4.80	1.20	5.00	15.00	1.00	3.50	80.00	700.00	5.00	-99.00
0	4.80	1.20	5.00	15.00	1.00	3.50	80.00	700.00	5.00	-99.00
0	4.10	1.20	5.00	15.00	1.00	3.50	80.00	700.00	5.00	-99.00
0	4.00	1.20	5.00	15.00	1.00	3.50	80.00	700.00	5.00	-99.00
0	3.30	1.20	5.00	15.00	1.00	3.50	80.00	700.00	5.00	-99.00
0	3.00	0.30	5.00	15.00	1.00	3.50	85.00	700.00	5.00	-99.00

41334	24 APRIL 86	STROBE							
1	1.10	0.00	20.00	10.00	0.20	1.50	15.00	5.00	1.10
1	0.00	0.20	20.00	10.00	0.20	1.50	15.00	5.00	1.30
1	1.00	0.20	20.00	10.00	0.20	1.50	15.00	5.00	1.70
1	2.40	0.20	20.00	10.00	0.20	1.50	15.00	5.00	2.40
1	1.00	0.30	20.00	10.00	0.20	1.50	15.00	5.00	2.30
1	0.50	1.00	20.00	10.00	0.20	1.50	15.00	5.00	1.90
1	0.10	1.30	20.00	10.00	0.20	1.50	15.00	5.00	2.70
1	4.20	1.60	20.00	10.00	0.20	1.50	15.00	5.00	4.50
1	2.90	1.50	20.00	10.00	0.20	1.50	15.00	5.00	3.30
1	0.90	1.80	20.00	10.00	0.20	1.50	15.00	5.00	3.60

1	0.60	2.00	20.00	10.00	0.20	1.50	15.00	5.00	3.10
1	1.20	1.20	20.00	10.00	0.20	1.50	15.00	5.00	1.50
1	0.60	2.50	20.00	10.00	0.20	1.50	15.00	5.00	1.30
1	0.40	2.90	20.00	10.00	0.20	1.50	15.00	5.00	2.40
1	0.60	2.80	20.00	10.00	0.20	1.50	15.00	5.00	0.80
0	1.80	0.40	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	2.90	0.20	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	2.90	0.20	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	4.80	0.10	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	5.00	0.60	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	2.30	1.00	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	3.70	0.90	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	2.50	1.20	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	1.80	1.30	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	3.50	1.40	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	1.60	1.70	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	2.00	1.80	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	1.10	2.10	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	2.00	2.30	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	2.80	1.90	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	3.90	2.10	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	2.00	2.50	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	3.40	2.50	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	2.60	2.70	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	1.40	3.00	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	4.30	2.90	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	3.30	3.10	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	2.10	2.30	20.00	10.00	0.20	1.50	15.00	5.00	-99.00

41335 24 APRIL 86 STROME

1	1.20	0.10	20.00	10.00	0.20	1.50	15.00	5.00	2.10
1	0.90	0.20	20.00	10.00	0.20	1.50	15.00	5.00	2.50
1	0.10	0.30	20.00	10.00	0.20	1.50	15.00	5.00	4.30
1	1.90	0.40	20.00	10.00	0.20	1.50	15.00	5.00	2.00

1	0.50	1.10	20.00	10.00	0.20	1.50	15.00	5.00	0.80
1	3.60	1.20	20.00	10.00	0.20	1.50	15.00	5.00	3.90
1	0.40	1.70	20.00	10.00	0.20	1.50	15.00	5.00	0.80
1	0.30	1.90	20.00	10.00	0.20	1.50	15.00	5.00	1.10
1	0.60	3.00	20.00	10.00	0.20	1.50	15.00	5.00	1.30
1	0.10	3.00	20.00	10.00	0.20	1.50	15.00	5.00	1.80
0	2.60	0.20	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	3.90	0.60	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	3.10	0.80	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	3.90	1.10	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	1.50	1.60	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	2.40	1.80	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	1.10	2.00	10.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	2.30	1.60	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	1.40	1.40	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	2.50	2.40	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	0.60	2.60	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	1.30	2.90	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	2.00	2.60	20.00	10.00	0.20	1.50	15.00	5.00	-99.00
0	1.60	3.30	20.00	6.00	0.20	1.00	15.00	5.00	-99.00
0	1.40	3.60	20.00	6.00	0.20	1.00	15.00	5.00	-99.00
0	4.30	3.50	20.00	6.00	0.20	1.00	15.00	5.00	-99.00
0	0.30	3.80	20.00	6.00	0.20	1.00	15.00	5.00	-99.00
0	1.00	4.10	20.00	6.00	0.20	1.00	15.00	5.00	-99.00
0	0.70	4.40	20.00	6.00	0.20	1.00	15.00	5.00	-99.00
0	1.90	4.50	20.00	6.00	0.20	1.00	15.00	5.00	-99.00
0	2.70	4.20	20.00	6.00	0.20	1.00	15.00	5.00	-99.00
0	3.30	4.50	20.00	6.00	0.20	1.00	15.00	5.00	-99.00
0	4.80	4.00	20.00	6.00	0.20	1.00	15.00	5.00	-99.00
0	4.00	3.70	20.00	6.00	0.20	1.00	15.00	5.00	-99.00
0	2.00	3.90	20.00	6.00	0.20	1.00	15.00	5.00	-99.00
0	1.10	1.00	20.00	6.00	0.20	1.00	15.00	5.00	-99.00
0	3.70	2.00	20.00	5.00	0.20	1.00	15.00	5.00	-99.00
0	3.20	3.20	20.00	6.00	0.20	1.00	15.00	5.00	-99.00
0	4.00	2.80	20.00	6.00	0.20	1.00	15.00	5.00	-99.00
0	2.10	2.70	20.00	6.00	0.20	1.00	15.00	5.00	-99.00

HH-52A 1418	24 APRIL 86	STROBE	0.20	1.50	85.00	1000.00	5.00	1.20
1	1.10	20.00	0.20	1.50	85.00	1000.00	5.00	1.20
1	2.10	20.00	0.20	1.50	85.00	1000.00	5.00	2.40
1	0.20	20.00	0.20	1.50	85.00	1000.00	5.00	0.80
1	3.60	20.00	0.20	1.50	85.00	1000.00	5.00	3.60
1	1.20	20.00	0.20	1.50	85.00	1000.00	5.00	1.60
1	0.10	20.00	0.20	1.50	85.00	1000.00	5.00	0.80
1	0.90	20.00	0.20	1.50	85.00	1000.00	5.00	0.90
1	2.00	20.00	0.20	1.50	85.00	1000.00	5.00	2.30
1	0.70	20.00	0.20	1.50	85.00	1000.00	5.00	1.10
1	1.80	20.00	0.20	1.50	85.00	1000.00	5.00	2.10
1	1.10	20.00	0.20	1.50	85.00	1000.00	5.00	1.80
1	0.20	20.00	0.20	1.50	85.00	1000.00	5.00	1.90
0	2.30	20.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.50	20.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.00	20.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	4.90	20.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	4.30	20.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	1.70	20.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	2.90	20.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	2.20	20.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	2.00	20.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	1.30	20.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.00	20.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.80	20.00	0.20	1.50	85.00	1000.00	5.00	-99.00
1	2.40	20.00	0.20	1.50	85.00	1000.00	5.00	2.50
0	3.00	20.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	4.80	20.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.50	20.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.50	20.00	0.20	1.50	85.00	1000.00	5.00	-99.00
1	0.70	20.00	0.20	1.50	85.00	1000.00	5.00	1.40
1	0.10	20.00	0.20	1.50	85.00	1000.00	5.00	1.20
1	2.70	20.00	0.20	1.50	85.00	1000.00	5.00	2.80
1	0.70	20.00	0.20	1.50	85.00	1000.00	5.00	0.80
1	0.30	20.00	0.20	1.50	85.00	1000.00	5.00	2.10
0	3.50	20.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	4.80	20.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	5.70	20.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.90	20.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	2.40	20.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	2.90	20.00	0.20	1.50	85.00	1000.00	5.00	-99.00
1	0.20	20.00	0.20	1.50	85.00	1000.00	5.00	1.20

1	1.00	0.50	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	4.00
1	1.70	0.50	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	2.40
1	0.10	0.50	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.30
0	6.10	0.80	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.50	0.50	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	1.70	0.60	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
1	0.80	0.60	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	3.40
0	2.00	0.60	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.00	0.50	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.20	0.70	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.10	0.80	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.20	0.80	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	6.10	0.80	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.45	0.80	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	1.30	0.80	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	4.30	0.80	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	2.40	0.90	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	6.00	0.80	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	4.30	0.80	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	0.30	0.90	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	0.40
1	0.70	0.90	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	0.90
1	1.20	1.00	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.70
1	1.20	1.10	20.00	6.00	0.20	1.00	85.00	1000.00	5.00	1.20
1	0.20	1.10	20.00	6.00	0.20	1.00	85.00	1000.00	5.00	1.00
1	0.60	1.10	20.00	6.00	0.20	1.00	85.00	1000.00	5.00	0.80
1	1.40	1.20	20.00	6.00	0.20	1.00	85.00	1000.00	5.00	2.00
1	1.70	1.10	20.00	6.00	0.20	1.00	85.00	1000.00	5.00	3.30
1	1.20	1.30	20.00	6.00	0.20	1.00	85.00	1000.00	5.00	2.60
1	1.80	0.90	20.00	6.00	0.20	1.00	85.00	1000.00	5.00	2.40
0	2.90	0.80	20.00	6.00	0.20	1.00	85.00	1000.00	5.00	-99.00
0	3.50	1.60	20.00	6.00	0.20	1.00	85.00	1000.00	5.00	-99.00
0	0.10	1.10	20.00	6.00	0.20	1.00	85.00	1000.00	5.00	2.40
0	2.30	1.00	20.00	6.00	0.20	1.00	85.00	1000.00	5.00	-99.00
0	2.60	1.10	20.00	10.00	0.20	1.00	85.00	1000.00	5.00	-99.00
0	1.90	1.20	20.00	6.00	0.20	1.00	85.00	1000.00	5.00	-99.00
0	2.50	1.20	20.00	6.00	0.20	1.00	85.00	1000.00	5.00	-99.00
0	3.00	1.20	20.00	6.00	0.20	1.00	85.00	1000.00	5.00	-99.00
0	4.20	1.20	20.00	6.00	0.20	1.00	85.00	1000.00	5.00	-99.00
0	3.60	1.30	20.00	6.00	0.20	1.00	85.00	1000.00	5.00	-99.00
0	3.30	1.30	20.00	6.00	0.20	1.00	85.00	1000.00	5.00	-99.00
1	0.30	1.30	20.00	6.00	0.20	1.00	85.00	1000.00	5.00	0.80

1	1.80	1.40	20.00	6.00	0.20	1.00	85.00	1000.00	5.00	1.90
1	2.30	1.30	20.00	6.00	0.20	1.00	85.00	1000.00	5.00	2.40
0	3.90	1.30	20.00	6.00	0.20	1.00	85.00	1000.00	5.00	-99.00
0	2.00	1.40	20.00	6.00	0.20	1.00	85.00	1000.00	5.00	-99.00
0	0.90	1.40	20.00	6.00	0.20	1.00	85.00	1000.00	5.00	-99.00
0	2.50	1.40	20.00	6.00	0.20	1.00	85.00	1000.00	5.00	-99.00
0	1.30	1.40	20.00	6.00	0.20	1.00	85.00	1000.00	5.00	-99.00
0	5.50	0.90	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	5.40	0.90	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.60	0.90	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	4.70	1.00	20.00	6.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	4.60	1.00	20.00	6.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	4.40	1.00	20.00	6.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.00	1.10	20.00	6.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	4.90	1.10	20.00	6.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	5.20	1.20	20.00	6.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.80	1.20	20.00	6.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	5.90	1.30	20.00	6.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	5.50	1.20	20.00	6.00	0.20	1.50	85.00	1000.00	5.00	-99.00

HH-52A 1463		24 APRIL 86		STROBE						
1	0.20	0.10	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.00
1	1.90	0.10	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	2.70
1	1.30	0.10	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	2.10
1	1.10	0.20	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.80
1	0.90	0.20	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.00
1	1.50	0.20	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.70
1	1.20	0.20	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	2.50
1	0.70	0.30	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.30
1	0.60	0.30	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	2.20
1	1.70	0.30	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.80
1	1.10	0.30	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.60
1	0.00	0.40	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	0.10
0	2.50	0.00	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	1.20	0.00	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
1	3.00	0.10	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	3.80
1	3.00	0.20	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	3.30
0	3.70	0.10	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00

0	3.50	0.20	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	2.30	0.20	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	4.00	0.40	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.40	0.10	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	4.20	0.00	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	5.00	0.00	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	2.10	0.20	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.60	0.20	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	2.10	0.30	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.60	0.30	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.90	0.30	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.20	0.40	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	2.60	0.40	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	0.10	0.00	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
1	2.30	0.00	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.10
1	0.90	0.50	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	2.30
1	1.70	0.60	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.00
1	1.60	0.60	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.80
1	1.40	0.60	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.80
1	0.00	0.60	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	2.10
1	2.80	0.60	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.20
1	0.60	0.70	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	2.80
1	1.00	0.70	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.00
1	0.10	0.80	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.00
0	1.70	0.50	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.60
0	0.30	0.50	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.10	0.50	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	4.60	0.50	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.60	0.50	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
1	2.00	1.00	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	1.40	0.60	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	2.20
0	3.50	0.60	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.30	0.70	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	0.80	0.70	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.30	0.70	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	2.20	0.80	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.60	0.80	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.00	0.80	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	1.40	0.80	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	2.50	0.90	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	4.30	0.80	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00

1	0.50	0.90	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	0.80
1	1.70	0.90	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	2.00
1	3.50	0.90	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	3.50
1	0.80	0.90	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.20
1	0.20	0.90	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	0.20
1	1.70	0.90	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.90
1	0.80	0.90	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	0.90
1	1.10	0.90	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.50
1	0.10	1.00	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.40
1	2.90	1.00	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	3.90
1	1.30	1.10	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.50
1	0.10	1.10	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	0.40
1	1.80	1.10	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.80
1	0.70	1.10	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	0.80
1	0.20	1.10	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.60
1	1.50	1.20	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	2.50
1	3.50	1.30	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	3.40
1	3.80	1.20	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	4.40
0	2.90	0.90	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.20	1.00	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	2.70	1.10	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.10	1.10	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	2.60	1.10	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	2.50	1.10	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	4.20	1.10	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	1.60	1.10	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	1.60	1.10	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	2.40	1.20	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.80	1.20	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	1.30	1.20	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.70	1.30	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.30	1.30	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
1	1.20	1.30	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.80
1	1.20	1.30	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	2.00
1	0.30	1.40	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.50
1	0.70	1.40	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	3.60
1	1.80	1.40	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	2.50
1	1.70	1.40	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.70
1	0.50	1.50	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	0.60

1	1.20	1.50	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.70
1	0.70	1.50	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.30
1	2.40	1.50	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	3.10
1	1.80	1.70	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	2.00
1	1.00	1.60	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	1.00
1	4.00	1.60	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	4.10
0	2.80	1.40	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.30	1.30	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.60	1.30	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	4.10	1.40	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	2.30	1.40	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	4.20	1.40	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
1	0.30	1.50	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	2.50
0	3.00	1.50	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	0.30	1.50	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	2.80	1.50	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	1.10	1.50	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	4.60	1.60	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	2.10	1.60	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	2.90	1.50	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	0.40	1.70	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.00	1.70	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.60	1.70	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00
0	3.00	1.60	20.00	10.00	0.20	1.50	85.00	1000.00	5.00	-99.00

41310 25 APRIL 86 STROBE

1	1.00	0.10	10.00	4.00	0.60	3.00	15.00	5.00	1.10
0	1.20	0.50	10.00	4.00	0.60	3.00	15.00	5.00	-99.00
1	1.60	0.50	10.00	4.00	0.60	3.00	15.00	5.00	1.60
1	2.10	0.50	10.00	4.00	0.60	3.00	15.00	5.00	3.00
1	0.70	0.50	10.00	4.00	0.60	3.00	15.00	5.00	2.00
0	3.50	0.80	10.00	4.00	0.60	3.00	15.00	5.00	-99.00
1	2.00	0.90	10.00	4.00	0.60	3.00	15.00	5.00	4.00
1	0.00	1.00	10.00	4.00	0.60	3.00	15.00	5.00	0.70
1	1.40	1.10	10.00	4.00	0.60	3.00	15.00	5.00	2.70
1	0.40	1.30	10.00	4.00	0.60	3.00	15.00	5.00	1.40

1	0.20	1.70	10.00	4.00	0.60	3.00	15.00	5.00	1.50
1	0.60	1.80	15.00	4.00	0.60	1.50	15.00	5.00	1.10
1	1.00	2.00	15.00	4.00	0.60	1.50	15.00	5.00	2.20
1	0.20	2.30	15.00	4.00	0.60	1.50	15.00	5.00	0.50
1	0.80	2.40	15.00	4.00	0.60	3.50	15.00	5.00	3.00
0	2.80	0.30	10.00	4.00	0.60	3.00	15.00	5.00	-99.00
0	3.50	0.30	10.00	4.00	0.60	3.00	15.00	5.00	-99.00
0	0.20	0.30	10.00	4.00	0.60	3.00	15.00	5.00	-99.00
0	2.70	1.00	10.00	4.00	0.60	3.00	15.00	5.00	-99.00
0	3.10	0.90	10.00	4.00	0.60	3.00	15.00	5.00	-99.00
0	1.70	1.20	10.00	4.00	0.60	3.00	15.00	5.00	-99.00
0	3.40	1.50	10.00	4.00	0.60	3.00	15.00	5.00	-99.00
0	2.00	1.50	10.00	4.00	0.60	3.00	15.00	5.00	-99.00
0	3.20	1.80	15.00	4.00	0.60	1.50	15.00	5.00	-99.00
0	1.40	2.00	15.00	4.00	0.60	1.50	15.00	5.00	-99.00
0	4.20	2.00	15.00	4.00	0.60	1.50	15.00	5.00	-99.00
0	2.40	2.10	15.00	4.00	0.60	1.50	15.00	5.00	-99.00
0	1.70	2.10	15.00	4.00	0.60	1.50	15.00	5.00	-99.00
0	2.40	2.30	15.00	4.00	0.60	1.50	15.00	5.00	-99.00
0	1.40	2.30	15.00	4.00	0.60	1.50	15.00	5.00	-99.00
0	1.40	2.30	15.00	4.00	0.60	1.50	15.00	5.00	-99.00
0	3.80	2.30	15.00	4.00	0.60	3.50	15.00	5.00	-99.00
0	2.70	2.50	15.00	4.00	0.60	3.50	15.00	5.00	-99.00
0	1.70	2.70	15.00	4.00	0.60	3.50	15.00	5.00	-99.00
0	3.40	2.90	15.00	4.00	0.60	3.50	15.00	5.00	-99.00

41344 25 APRIL 86 STROBE

1	2.90	0.00	10.00	4.00	0.60	3.00	15.00	5.00	3.50
1	0.60	0.30	10.00	4.00	0.60	3.00	15.00	5.00	0.60
1	2.30	0.60	10.00	4.00	0.60	3.00	15.00	5.00	2.40
1	4.00	0.40	10.00	4.00	0.60	3.00	15.00	5.00	4.10
1	0.10	0.40	10.00	4.00	0.60	3.00	15.00	5.00	1.00
1	3.00	0.60	10.00	4.00	0.60	3.00	15.00	5.00	3.20
1	1.50	0.50	10.00	4.00	0.60	3.00	15.00	5.00	1.50
1	3.90	0.70	10.00	4.00	0.60	3.00	15.00	5.00	4.00
1	1.40	0.80	10.00	4.00	0.60	3.00	15.00	5.00	1.40

0	2.40	0.90	10.00	4.00	0.60	3.00	15.00	5.00	-99.00
1	2.00	1.40	10.00	4.00	0.60	3.00	15.00	5.00	2.10
1	0.60	1.20	10.00	4.00	0.60	3.00	15.00	5.00	0.60
1	1.80	1.50	10.00	4.00	0.60	3.00	15.00	5.00	2.80
1	2.10	1.50	10.00	4.00	0.60	3.00	15.00	5.00	2.50
1	0.40	1.80	10.00	4.00	0.60	3.00	15.00	5.00	1.40
1	0.70	1.80	10.00	4.00	0.60	3.00	15.00	5.00	3.10
1	0.30	1.90	10.00	4.00	0.60	3.00	15.00	5.00	0.30
1	1.20	2.20	15.00	4.00	0.60	1.50	15.00	5.00	1.30
1	2.80	2.40	15.00	4.00	0.60	1.50	15.00	5.00	3.20
1	0.20	2.50	15.00	4.00	0.60	1.50	15.00	5.00	0.80
1	1.50	0.00	10.00	4.00	0.60	3.00	15.00	5.00	2.60
0	2.10	0.30	10.00	4.00	0.60	3.00	15.00	5.00	-99.00
0	2.40	1.00	10.00	4.00	0.60	3.00	15.00	5.00	-99.00
0	0.90	1.20	10.00	4.00	0.60	3.00	15.00	5.00	-99.00
0	3.50	1.20	10.00	4.00	0.60	3.00	15.00	5.00	-99.00
0	4.30	1.30	10.00	4.00	0.60	3.00	15.00	5.00	-99.00
0	4.30	1.70	10.00	4.00	0.60	3.00	15.00	5.00	-99.00
0	3.50	1.90	10.00	4.00	0.60	3.00	15.00	5.00	-99.00
0	3.50	2.00	15.00	4.00	0.60	1.50	15.00	5.00	-99.00
0	1.50	2.10	15.00	4.00	0.60	1.50	15.00	5.00	-99.00
0	3.30	2.30	15.00	4.00	0.60	1.50	15.00	5.00	-99.00
0	4.20	2.50	15.00	4.00	0.60	3.50	15.00	5.00	-99.00

HH-52A 1463		25 APRIL 86		STROBE						
1	0.90	0.10	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	3.10
1	2.10	0.10	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	2.80
1	3.90	0.10	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	3.90
1	0.10	0.10	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	2.60
1	1.80	0.10	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	4.20
1	2.90	0.20	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	4.30
1	1.20	0.20	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	1.90
1	0.30	0.30	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	1.30
1	1.70	0.30	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	2.30
1	0.90	0.30	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	2.40
1	0.90	0.30	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	2.50

1	2.80	0.50	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	2.80
0	3.20	0.10	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	2.60	0.10	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	4.70	0.10	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	4.30	0.20	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	4.50	0.20	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	1.10	0.30	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	0.20	0.30	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	3.40	0.30	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	1.70	0.30	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
1	1.30	0.60	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	2.10
1	0.90	0.80	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	1.70
1	1.00	0.80	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	2.30
1	0.20	0.90	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	2.20
1	1.20	0.90	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	2.10
1	2.90	0.90	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	3.00
1	0.00	1.00	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	2.20
1	1.00	1.00	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	1.70
1	4.00	1.00	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	4.60
0	3.90	0.70	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	5.00	0.60	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	4.10	0.60	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	2.70	0.60	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	3.30	0.60	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	2.00	0.70	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	4.50	0.70	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	2.00	0.80	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	2.90	0.90	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	2.20	1.10	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	3.40	1.00	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	2.80	1.00	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	4.75	1.00	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
1	0.70	1.10	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	1.60
1	1.60	1.10	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	2.30
1	1.50	1.20	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	3.20
1	0.30	1.30	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	2.10
1	2.30	1.30	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	2.70
1	4.80	1.30	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	4.80
1	0.30	1.30	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	1.30
1	3.40	1.30	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	4.40
1	2.40	1.40	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	2.40
1	0.80	1.40	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	1.10

1	1.20	1.40	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	2.00
1	1.75	1.50	15.00	5.00	0.60	1.50	85.00	1000.00	5.00	2.40
0	2.70	1.10	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	3.40	1.10	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	3.70	1.30	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	4.60	1.30	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	4.40	1.30	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	2.10	1.30	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	4.20	1.30	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	2.40	1.40	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	3.20	1.40	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	1.60	1.40	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	1.50	1.40	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	2.80	1.40	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	4.50	1.40	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	3.20	1.50	15.00	5.00	0.60	1.50	85.00	1000.00	5.00	-99.00
0	3.30	1.60	15.00	5.00	0.60	1.50	85.00	1000.00	5.00	-99.00
0	1.20	1.60	15.00	5.00	0.60	1.50	85.00	1000.00	5.00	-99.00
0	1.40	1.60	15.00	5.00	0.60	1.50	85.00	1000.00	5.00	-99.00
0	3.80	1.60	15.00	5.00	0.60	1.50	85.00	1000.00	5.00	-99.00
1	1.30	1.60	15.00	5.00	0.60	1.50	85.00	1000.00	5.00	1.30
0	1.50	1.70	15.00	5.00	0.60	1.50	85.00	1000.00	5.00	-99.00
0	3.80	1.60	15.00	5.00	0.60	1.50	85.00	1000.00	5.00	-99.00
0	1.60	1.70	15.00	5.00	0.60	1.50	85.00	1000.00	5.00	-99.00
0	3.10	1.70	15.00	5.00	0.60	1.50	85.00	1000.00	5.00	-99.00
0	3.10	1.80	15.00	5.00	0.60	1.50	85.00	1000.00	5.00	-99.00
0	1.80	1.80	15.00	5.00	0.60	1.50	85.00	1000.00	5.00	-99.00
0	1.40	1.80	15.00	5.00	0.60	1.50	85.00	1000.00	5.00	-99.00
0	2.50	1.80	15.00	5.00	0.60	1.50	85.00	1000.00	5.00	-99.00
0	4.50	1.80	15.00	5.00	0.60	1.50	85.00	1000.00	5.00	-99.00
0	2.60	1.80	15.00	5.00	0.60	1.50	85.00	1000.00	5.00	-99.00
0	3.50	1.80	15.00	5.00	0.60	1.50	85.00	1000.00	5.00	-99.00
0	1.85	1.80	15.00	5.00	0.60	1.50	85.00	1000.00	5.00	-99.00
0	2.00	1.80	15.00	5.00	0.60	1.50	85.00	1000.00	5.00	-99.00
1	3.00	0.30	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	3.10
0	1.40	0.40	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	3.30	0.40	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
1	0.20	0.40	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	3.50
0	4.20	0.50	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	2.00	0.40	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
1	0.40	0.80	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	5.50

1	1.80	0.80	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	3.40
0	0.00	0.60	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
0	3.50	1.00	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00
1	0.40	1.30	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	2.60
1	1.80	1.80	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	1.80
1	1.40	1.80	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	2.40
0	0.90	1.80	10.00	5.00	0.60	3.00	85.00	1000.00	5.00	-99.00

41335	6 MAY 86	STROBE								
1	0.00	0.00	10.00	4.00	0.40	1.50	15.00	5.00	1.00	
1	0.20	0.10	10.00	4.00	0.40	1.50	15.00	5.00	0.20	
1	1.20	0.90	10.00	4.00	0.40	1.50	15.00	5.00	2.00	
1	1.70	1.00	10.00	4.00	0.40	1.50	15.00	5.00	2.50	
1	2.80	1.60	10.00	5.00	0.40	1.50	15.00	5.00	4.20	
1	0.00	1.70	10.00	5.00	0.40	1.50	15.00	5.00	0.90	
1	0.60	1.90	10.00	5.00	0.40	1.50	15.00	5.00	0.80	
1	0.10	2.00	10.00	5.00	0.40	1.50	15.00	5.00	2.40	
1	1.30	2.50	10.00	5.00	0.30	1.50	15.00	5.00	2.70	
1	0.30	2.90	10.00	5.00	0.30	1.50	15.00	5.00	0.30	
0	2.90	0.30	10.00	4.00	0.40	1.50	15.00	5.00	-99.00	
0	2.60	0.40	10.00	4.00	0.40	1.50	15.00	5.00	-99.00	
0	1.60	0.60	10.00	4.00	0.40	1.50	15.00	5.00	-99.00	
0	0.70	0.70	10.00	4.00	0.40	1.50	15.00	5.00	-99.00	
0	1.70	0.80	10.00	4.00	0.40	1.50	15.00	5.00	-99.00	
0	2.90	0.90	10.00	4.00	0.40	1.50	15.00	5.00	-99.00	
0	3.90	0.90	10.00	4.00	0.40	1.50	15.00	5.00	-99.00	
0	4.70	0.00	10.00	4.00	0.40	1.50	15.00	5.00	-99.00	
0	1.20	1.10	10.00	4.00	0.40	1.50	15.00	5.00	-99.00	
0	1.20	1.30	10.00	5.00	0.40	1.50	15.00	5.00	-99.00	
0	1.90	1.50	10.00	5.00	0.40	1.50	15.00	5.00	-99.00	
0	4.40	1.50	10.00	5.00	0.40	1.50	15.00	5.00	-99.00	
0	2.80	2.00	10.00	5.00	0.40	1.50	15.00	5.00	-99.00	
0	2.10	2.00	10.00	5.00	0.40	1.50	15.00	5.00	-99.00	
0	0.80	2.30	10.00	5.00	0.40	1.50	15.00	5.00	-99.00	
0	1.80	2.50	10.00	5.00	0.30	1.50	15.00	5.00	-99.00	
0	4.10	2.60	10.00	5.00	0.30	1.50	15.00	5.00	-99.00	
0	4.20	2.80	10.00	5.00	0.30	1.50	15.00	5.00	-99.00	
0	3.30	1.40	10.00	4.00	0.40	1.50	15.00	5.00	-99.00	

0	2.30	1.20	10.00	4.00	0.40	1.50	15.00	5.00	-99.00
0	4.10	1.50	10.00	4.00	0.40	1.50	15.00	5.00	-99.00
0	2.50	1.80	10.00	5.00	0.40	1.50	15.00	5.00	-99.00
0	2.50	2.00	10.00	5.00	0.40	1.50	15.00	5.00	-99.00
1	2.20	2.00	10.00	5.00	0.40	1.50	15.00	5.00	2.40
0	4.40	2.10	10.00	5.00	0.40	1.50	15.00	5.00	-99.00
0	4.30	2.20	10.00	5.00	0.40	1.50	15.00	5.00	-99.00
0	1.20	2.40	10.00	5.00	0.40	1.50	15.00	5.00	-99.00
1	1.50	2.50	10.00	5.00	0.40	1.50	15.00	5.00	1.60
0	3.90	2.40	10.00	5.00	0.40	1.50	15.00	5.00	-99.00
0	4.70	0.60	10.00	4.00	0.40	1.50	15.00	5.00	-99.00
0	4.50	1.20	10.00	4.00	0.40	1.50	15.00	5.00	-99.00

HH-52A 1418 6 MAY 86 STROBE

1	1.30	0.10	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	3.80
1	1.20	0.10	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	2.60
1	1.60	0.20	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	1.80
1	1.30	0.20	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	3.10
1	1.60	0.30	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	2.90
1	1.90	0.30	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	1.90
1	0.40	0.40	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	3.90
1	0.50	0.00	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	0.50
1	1.40	0.10	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	1.60
1	4.10	0.00	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	4.70
0	3.70	0.00	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	4.20	0.10	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	4.20	0.10	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	3.50	0.20	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	5.70	0.10	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	3.40	0.30	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	2.90	0.30	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	5.10	0.30	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	6.40	0.00	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	2.30	0.30	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	4.70	0.30	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	4.70	0.40	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	-99.00
1	0.30	0.50	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	-99.00
1	2.20	0.60	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	2.60
1	0.50	0.60	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	3.30
1	1.70	0.60	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	3.90
1										3.10

1	3.00	0.70	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	3.10
1	3.40	0.70	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	3.50
1	1.20	0.70	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	2.20
1	1.80	0.80	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	1.80
1	0.40	0.80	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	1.10
1	1.30	0.90	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	2.10
1	0.30	0.90	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	3.20
1	4.20	1.00	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	5.00
1	4.70	0.50	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	4.70	0.60	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	1.80	0.60	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	5.20	0.70	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	3.20	0.70	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	1.70	0.80	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	3.10	0.80	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	4.10	0.80	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	3.80	0.90	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	4.20	1.00	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	6.20	0.70	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	6.40	1.00	10.00	4.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	0.00	1.10	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
1	2.50	1.20	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	2.00
1	1.80	1.20	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	3.20
1	1.10	1.20	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	1.80
1	0.80	1.30	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	2.30
1	0.50	1.30	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	3.80
0	6.50	1.10	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	2.80
1	0.40	1.10	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
1	1.60	1.10	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	3.00
0	3.00	1.10	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	2.80
0	4.80	1.00	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	5.30	1.10	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	5.50	1.20	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	3.40	1.10	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	2.30	1.10	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	1.50	1.20	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	4.20	1.20	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	6.90	1.10	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	0.30	1.20	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	3.10	1.20	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	4.60	1.30	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	3.70	1.30	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00

0	4.50	1.30	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	3.70	1.40	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	6.00	1.40	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	4.10	1.40	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	3.20	1.30	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	6.50	1.30	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
1	0.60	1.40	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	1.00
1	1.00	1.50	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	3.20
1	1.80	1.50	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	3.50
1	3.00	1.60	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	3.10
1	2.60	1.60	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	3.30
1	1.50	1.60	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	1.70
1	2.40	1.70	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	2.50
1	2.40	1.70	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	4.50
1	3.30	1.70	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	3.60
1	1.60	1.70	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	3.30
0	0.10	1.70	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	6.30	1.60	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	5.90	1.50	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
1	3.00	1.80	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	3.10
1	1.00	1.50	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	3.20
0	4.30	1.50	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	3.70	1.50	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	4.60	1.50	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	4.00	1.60	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	1.10	1.60	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	5.10	1.70	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	4.30	1.70	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	3.80	1.70	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	5.40	1.70	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	5.20	1.80	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00
0	4.90	1.80	10.00	5.00	0.40	1.50	85.00	1000.00	5.00	-99.00

41344	28 APRIL 86	HRRF	1.50	15.00	3.00	-99.00
0	5.60	0.10	10.00	5.00	3.00	4.80
1	4.70	0.20	10.00	5.00	3.00	-99.00
0	4.60	0.20	10.00	5.00	3.00	-99.00
0	4.60	0.40	10.00	5.00	3.00	-99.00

0	4.30	0.50	10.00	5.00	0.20	1.50	15.00	3.00	-99.00
0	3.20	0.60	10.00	5.00	0.20	1.50	15.00	3.00	-99.00
1	2.30	0.70	10.00	5.00	0.20	1.50	15.00	3.00	2.60
1	1.70	0.80	10.00	5.00	0.20	1.50	15.00	3.00	1.70
1	3.20	1.10	10.00	5.00	0.20	1.50	15.00	3.00	3.30
1	3.00	1.20	10.00	5.00	0.20	1.50	15.00	3.00	3.20
1	2.50	1.30	10.00	5.00	0.20	1.50	15.00	3.00	2.70
1	1.70	1.50	10.00	5.00	0.20	1.50	15.00	3.00	1.50
0	3.10	1.90	10.00	7.00	0.30	1.50	15.00	3.00	-99.00
0	5.40	2.20	10.00	7.00	0.30	1.50	15.00	3.00	-99.00
0	6.80	0.00	10.00	5.00	0.20	1.50	15.00	3.00	-99.00
0	7.40	0.20	10.00	5.00	0.20	1.50	15.00	3.00	-99.00
0	6.40	0.70	10.00	5.00	0.20	1.50	15.00	3.00	-99.00
0	5.70	0.80	10.00	5.00	0.20	1.50	15.00	3.00	-99.00
0	4.40	0.90	10.00	5.00	0.20	1.50	15.00	3.00	-99.00
1	3.10	1.10	10.00	5.00	0.20	1.50	15.00	3.00	3.40
1	2.10	1.20	10.00	5.00	0.20	1.50	15.00	3.00	2.50
1	1.40	1.20	10.00	5.00	0.20	1.50	15.00	3.00	1.50
1	3.00	1.40	10.00	5.00	0.20	1.50	15.00	3.00	2.70
1	6.50	1.50	10.00	5.00	0.20	1.50	15.00	3.00	4.10
1	3.50	1.70	10.00	7.00	0.30	1.50	15.00	3.00	6.50
1	1.30	2.10	10.00	7.00	0.30	1.50	15.00	3.00	3.90
1	0.60	0.00	10.00	5.00	0.20	1.50	15.00	3.00	1.50
1	2.10	0.20	10.00	5.00	0.20	1.50	15.00	3.00	0.60
0	5.30	0.40	10.00	5.00	0.20	1.50	15.00	3.00	1.90
0	5.60	0.50	10.00	5.00	0.20	1.50	15.00	3.00	-99.00
0	6.00	1.30	10.00	5.00	0.20	1.50	15.00	3.00	-99.00
0	6.40	1.40	10.00	5.00	0.20	1.50	15.00	3.00	-99.00
0	7.40	2.20	10.00	7.00	0.20	1.50	15.00	3.00	-99.00
1	1.60	2.50	10.00	7.00	0.20	1.50	15.00	3.00	1.70
1	1.50	3.00	10.00	7.00	0.20	1.50	15.00	3.00	1.50
0	2.60	3.10	10.00	7.00	0.20	1.50	15.00	3.00	-99.00
1	4.20	3.30	10.00	7.00	0.20	1.50	15.00	3.00	4.20
1	3.50	3.50	10.00	7.00	0.20	1.50	15.00	3.00	3.60
1	2.10	3.60	10.00	7.00	0.20	1.50	15.00	3.00	2.60
0	4.60	4.10	10.00	7.00	0.20	1.50	15.00	3.00	-99.00
0	4.20	4.30	10.00	7.00	0.20	1.50	15.00	3.00	-99.00
1	1.90	2.30	10.00	7.00	0.30	1.50	15.00	3.00	1.90
1	2.40	2.40	10.00	7.00	0.30	1.50	15.00	3.00	2.50
1	4.90	2.70	10.00	7.00	0.30	1.50	15.00	3.00	4.90

1	4.80	2.80	10.00	7.00	0.20	1.50	15.00	3.00	4.80
1	2.00	3.00	10.00	7.00	0.20	1.50	15.00	3.00	2.70
1	0.70	3.20	10.00	7.00	0.20	1.50	15.00	3.00	1.30
1	1.20	3.30	10.00	7.00	0.20	1.50	15.00	3.00	1.30
0	3.50	3.50	10.00	7.00	0.20	1.50	15.00	3.00	-99.00
0	7.10	3.20	10.00	7.00	0.20	1.50	15.00	3.00	-99.00
0	8.00	2.30	10.00	7.00	0.30	1.50	15.00	3.00	-99.00
0	8.10	2.40	10.00	7.00	0.30	1.50	15.00	3.00	-99.00
1	4.30	3.10	10.00	7.00	0.20	1.50	15.00	3.00	4.30
1	2.30	3.50	10.00	7.00	0.20	1.50	15.00	3.00	2.60
1	1.40	3.70	10.00	7.00	0.20	1.50	15.00	3.00	1.50
1	3.10	4.00	10.00	7.00	0.20	1.50	15.00	3.00	3.20
1	1.70	4.20	10.00	7.00	0.20	1.50	15.00	3.00	1.90

41476	28 APRIL 86	HHRF							
1	3.90	0.00	10.00	5.00	0.20	1.50	15.00	3.00	3.90
1	2.80	0.10	10.00	5.00	0.20	1.50	15.00	3.00	3.20
1	2.10	0.20	10.00	5.00	0.20	1.50	15.00	3.00	2.30
1	2.20	0.30	10.00	5.00	0.20	1.50	15.00	3.00	2.20
1	3.00	0.40	10.00	5.00	0.20	1.50	15.00	3.00	3.00
1	3.30	0.80	10.00	5.00	0.20	1.50	15.00	3.00	3.80
1	1.30	0.90	10.00	5.00	0.20	1.50	15.00	3.00	2.00
1	0.70	1.00	10.00	5.00	0.20	1.50	15.00	3.00	0.90
1	2.70	1.20	10.00	5.00	0.20	1.50	15.00	3.00	3.30
1	4.10	1.70	10.00	7.00	0.30	1.50	15.00	3.00	4.10
1	3.30	2.00	10.00	7.00	0.30	1.50	15.00	3.00	3.70
0	5.60	0.10	10.00	5.00	0.20	1.50	15.00	3.00	-99.00
0	7.60	0.40	10.00	5.00	0.20	1.50	15.00	3.00	-99.00
0	8.20	0.70	10.00	5.00	0.20	1.50	15.00	3.00	-99.00
0	6.50	0.80	10.00	5.00	0.20	1.50	15.00	3.00	-99.00
0	5.80	0.00	10.00	5.00	0.20	1.50	15.00	3.00	-99.00
0	5.60	0.90	10.00	5.00	0.20	1.50	15.00	3.00	-99.00
1	4.50	1.00	10.00	5.00	0.20	1.50	15.00	3.00	4.90
1	3.30	1.10	10.00	5.00	0.20	1.50	15.00	3.00	3.40
1	2.90	1.20	10.00	5.00	0.20	1.50	15.00	3.00	3.00
1	2.10	1.40	10.00	5.00	0.20	1.50	15.00	3.00	2.40

1	1.50	1.60	10.00	7.00	0.30	1.50	15.00	3.00	1.50
0	8.10	0.10	10.00	5.00	0.20	1.50	15.00	3.00	-99.00
0	7.00	0.30	10.00	5.00	0.20	1.50	15.00	3.00	-99.00
1	0.30	1.90	10.00	7.00	0.30	1.50	15.00	3.00	0.60
0	3.90	2.60	10.00	7.00	0.20	1.50	15.00	3.00	-99.00
1	2.40	2.70	10.00	7.00	0.20	1.50	15.00	3.00	2.60
1	2.20	2.80	10.00	7.00	0.20	1.50	15.00	3.00	2.20
1	3.90	3.00	10.00	7.00	0.20	1.50	15.00	3.00	4.00
0	2.60	3.20	10.00	7.00	0.20	1.50	15.00	3.00	-99.00
1	1.30	3.30	10.00	7.00	0.20	1.50	15.00	3.00	1.70
0	4.60	3.80	10.00	7.00	0.20	1.50	15.00	3.00	-99.00
0	5.70	4.00	10.00	7.00	0.20	1.50	15.00	3.00	-99.00
0	7.80	2.10	10.00	7.00	0.30	1.50	15.00	3.00	-99.00
0	7.80	2.10	10.00	7.00	0.30	1.50	15.00	3.00	-99.00
0	8.20	2.60	10.00	7.00	0.20	1.50	15.00	3.00	-99.00
1	5.60	2.80	10.00	7.00	0.20	1.50	15.00	3.00	5.70
0	4.20	2.90	10.00	7.00	0.20	1.50	15.00	3.00	-99.00
1	3.20	3.00	10.00	7.00	0.20	1.50	15.00	3.00	3.70
1	1.70	3.20	10.00	7.00	0.20	1.50	15.00	3.00	1.70
1	1.90	3.90	10.00	7.00	0.20	1.50	15.00	3.00	2.00
1	1.80	2.00	10.00	7.00	0.30	1.50	15.00	3.00	1.80
1	2.00	2.20	10.00	7.00	0.30	1.50	15.00	3.00	2.20
1	1.10	2.80	10.00	7.00	0.20	1.50	15.00	3.00	1.20
1	3.80	3.20	10.00	7.00	0.20	1.50	15.00	3.00	3.90
1	3.90	3.40	10.00	7.00	0.20	1.50	15.00	3.00	4.10
0	7.30	3.90	10.00	7.00	0.20	1.50	15.00	3.00	-99.00

PT. FRANKLIN	28 APRIL 86	HRRF
1	4.60	0.20
1	4.00	0.30
1	4.10	0.30
1	4.50	0.50
1	3.40	0.60
1	2.40	0.60
1	1.50	0.70
1	1.40	0.90

1.50	14.50	3.00	4.60
1.50	14.50	3.00	4.10
1.50	14.50	3.00	4.10
1.50	14.50	3.00	4.60
1.50	14.50	3.00	3.70
1.50	14.50	3.00	2.90
1.50	14.50	3.00	1.90
1.50	14.50	3.00	1.40

1	3.40	1.20	10.00	5.00	0.20	1.50	14.50	3.00	3.40
1	3.70	1.30	10.00	5.00	0.20	1.50	14.50	3.00	3.80
1	3.60	1.40	10.00	5.00	0.20	1.50	14.50	3.00	3.60
1	3.10	1.60	10.00	5.00	0.20	1.50	14.50	3.00	3.50
1	3.50	2.00	10.00	7.00	0.30	1.50	14.50	3.00	3.60
1	3.50	2.30	10.00	7.00	0.30	1.50	14.50	3.00	3.70
1	2.40	0.00	10.00	5.00	0.20	1.50	14.50	3.00	2.80
1	1.90	0.10	10.00	5.00	0.20	1.50	14.50	3.00	1.90
1	3.80	0.40	10.00	5.00	0.20	1.50	14.50	3.00	4.30
1	5.50	0.50	10.00	5.00	0.20	1.50	14.50	3.00	5.60
1	4.20	0.80	10.00	5.00	0.20	1.50	14.50	3.00	4.70
1	3.20	0.90	10.00	5.00	0.20	1.50	14.50	3.00	3.50
1	1.60	1.00	10.00	5.00	0.20	1.50	14.50	3.00	1.70
1	1.10	1.10	10.00	5.00	0.20	1.50	14.50	3.00	1.20
1	1.10	1.20	10.00	5.00	0.20	1.50	14.50	3.00	1.00
1	1.40	1.30	10.00	5.00	0.20	1.50	14.50	3.00	1.40
1	2.40	1.40	10.00	5.00	0.20	1.50	14.50	3.00	2.40
1	4.10	1.50	10.00	5.00	0.20	1.50	14.50	3.00	4.20
1	5.00	1.60	10.00	5.00	0.20	1.50	14.50	3.00	5.10
0	7.90	2.20	10.00	7.00	0.30	1.50	14.50	2.00	-99.00
0	6.90	2.40	10.00	7.00	0.30	1.50	14.50	3.00	-99.00
0	6.60	2.50	10.00	7.00	0.30	1.50	14.50	3.00	-99.00
0	8.90	0.10	10.00	5.00	0.20	1.50	14.50	3.00	-99.00
0	9.10	0.30	10.00	5.00	0.20	1.50	14.50	3.00	-99.00
0	9.70	0.50	10.00	5.00	0.20	1.50	14.50	3.00	-99.00
0	8.10	0.70	10.00	5.00	0.20	1.50	14.50	3.00	-99.00
1	5.40	1.30	10.00	5.00	0.20	1.50	14.50	3.00	5.40
1	3.70	1.50	10.00	5.00	0.20	1.50	14.50	3.00	3.80
1	3.80	2.30	10.00	7.00	0.30	1.50	14.50	3.00	4.10
1	0.80	2.50	10.00	7.00	0.30	1.50	14.50	3.00	0.80
0	4.50	3.10	10.00	7.00	0.20	1.50	14.50	3.00	-99.00
0	5.70	3.30	10.00	7.00	0.20	1.50	14.50	3.00	-99.00
0	4.60	3.40	10.00	7.00	0.20	1.50	14.50	3.00	-99.00
1	2.60	3.50	10.00	7.00	0.20	1.50	14.50	3.00	3.30
1	0.90	3.70	10.00	7.00	0.20	1.50	14.50	3.00	1.10
1	1.20	3.80	10.00	7.00	0.20	1.50	14.50	3.00	1.20
1	3.00	4.30	10.00	7.00	0.20	1.50	14.50	3.00	3.00
1	2.70	4.50	10.00	7.00	0.20	1.50	14.50	3.00	2.70
0	5.50	2.70	10.00	7.00	0.30	1.50	14.50	3.00	-99.00
1	1.70	2.90	10.00	7.00	0.30	1.50	14.50	3.00	2.40
1	0.50	3.00	10.00	7.00	0.30	1.50	14.50	3.00	0.50

1	2.80	3.20	10.00	7.00	0.20	1.50	14.50	3.00	2.80
1	3.20	3.30	10.00	7.00	0.20	1.50	14.50	3.00	3.20
1	2.70	3.50	10.00	7.00	0.20	1.50	14.50	3.00	3.00
1	3.30	3.70	10.00	7.00	0.20	1.50	14.50	3.00	3.30
1	4.80	4.40	10.00	7.00	0.20	1.50	14.50	3.00	5.00
1	0.80	2.60	10.00	7.00	0.30	1.50	14.50	3.00	0.80
0	7.70	3.30	10.00	7.00	0.20	1.50	14.50	3.00	-99.00
1	2.60	3.70	10.00	7.00	0.20	1.50	14.50	3.00	2.80
1	0.70	3.80	10.00	7.00	0.20	1.50	14.50	3.00	1.10
1	2.90	4.20	10.00	7.00	0.20	1.50	14.50	3.00	3.20
0	4.20	4.50	10.00	7.00	0.20	1.50	14.50	3.00	-99.00

HH-52A 1418 28 APRIL 86 HRF

1	2.30	0.00	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	2.80
1	2.00	0.10	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	4.70
1	0.60	0.20	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	0.60
0	3.40	0.30	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	-99.00
0	5.50	0.40	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	-99.00
0	5.60	0.00	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	-99.00
1	3.30	0.20	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	5.50
1	0.60	0.30	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	0.70
1	3.40	0.10	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	3.90
1	1.00	0.30	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	2.50
1	4.20	0.40	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	5.10
1	0.80	0.50	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	2.50
0	2.90	0.70	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	-99.00
1	4.00	0.50	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	5.10
1	2.20	0.60	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	2.90
1	2.00	0.70	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	3.80
1	0.30	0.40	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	0.60
1	5.20	0.80	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	5.20
1	2.20	0.90	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	2.20
0	1.00	1.00	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	-99.00
1	3.20	1.30	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	4.00
0	3.60	0.80	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	-99.00
0	3.50	0.90	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	-99.00

1	2.50	1.00	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	4.30
1	7.70	1.10	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	8.90
0	1.10	1.20	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	-99.00
0	4.40	1.00	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	-99.00
1	1.40	1.20	10.00	5.00	0.20	1.50	90.00	1000.00	3.00	2.10

41310	29 APRIL 86	HHRF								
1	0.50	0.20	7.00	7.00	0.10	1.00	15.00	3.00	0.50	
1	4.70	0.40	7.00	7.00	0.10	1.00	15.00	3.00	5.00	
0	6.90	0.60	7.00	7.00	0.10	1.00	15.00	3.00	-99.00	
0	6.80	0.70	7.00	7.00	0.10	1.00	15.00	3.00	-99.00	
1	3.70	1.00	7.00	7.00	0.10	1.00	15.00	3.00	4.00	
0	8.40	0.10	7.00	7.00	0.10	1.00	15.00	3.00	-99.00	
0	6.20	0.30	7.00	7.00	0.10	1.00	15.00	3.00	-99.00	
0	5.10	0.40	7.00	7.00	0.10	1.00	15.00	3.00	-99.00	
1	4.20	0.60	7.00	7.00	0.10	1.00	15.00	3.00	4.80	
1	1.70	0.80	7.00	7.00	0.10	1.00	15.00	3.00	1.70	
0	7.00	1.40	7.00	7.00	0.10	1.00	15.00	3.00	-99.00	
0	6.00	1.80	7.00	7.00	0.10	1.00	15.00	3.00	-99.00	
1	4.60	0.20	7.00	7.00	0.10	1.00	15.00	3.00	4.60	
1	5.50	0.50	7.00	7.00	0.10	1.00	15.00	3.00	5.60	
0	6.00	0.60	7.00	7.00	0.10	1.00	15.00	3.00	-99.00	
1	1.30	1.10	7.00	7.00	0.10	1.00	15.00	3.00	1.30	
1	1.70	2.00	7.00	7.00	0.10	1.00	15.00	3.00	1.70	

41335	29 APRIL 86	HHRF								
1	5.40	0.40	8.00	7.00	0.10	1.00	12.00	3.00	5.60	
1	5.00	0.50	8.00	7.00	0.10	1.00	12.00	3.00	5.10	
0	8.10	0.10	8.00	7.00	0.10	1.00	12.00	3.00	-99.00	
1	4.90	0.70	8.00	7.00	0.10	1.00	12.00	3.00	5.00	

1	2.40	1.10	8.00	7.00	0.10	1.00	12.00	3.00	2.50
1	3.50	1.20	8.00	7.00	0.10	1.00	12.00	3.00	3.50
1	4.80	1.40	7.00	6.00	0.10	1.00	12.00	3.00	4.50
1	2.50	1.90	7.00	6.00	0.10	1.00	12.00	3.00	2.90
1	4.80	0.10	8.00	7.00	0.10	1.00	12.00	3.00	4.80
1	2.10	0.20	8.00	7.00	0.10	1.00	12.00	3.00	2.20
1	1.90	0.30	8.00	7.00	0.10	1.00	12.00	3.00	1.90
0	3.10	0.50	8.00	7.00	0.10	1.00	12.00	3.00	-99.00
1	4.10	0.70	8.00	7.00	0.10	1.00	12.00	3.00	4.40
1	4.30	0.80	8.00	7.00	0.10	1.00	12.00	3.00	4.30
1	4.00	0.90	8.00	7.00	0.10	1.00	12.00	3.00	4.30
1	3.50	1.00	8.00	7.00	0.10	1.00	12.00	3.00	3.90
1	2.40	1.00	8.00	7.00	0.10	1.00	12.00	3.00	3.00
1	1.60	1.10	8.00	7.00	0.10	1.00	12.00	3.00	1.90
1	0.60	1.20	8.00	7.00	0.10	1.00	12.00	3.00	0.90
1	0.20	1.20	8.00	7.00	0.10	1.00	12.00	3.00	0.20
1	1.10	1.40	8.00	7.00	0.10	1.00	12.00	3.00	1.30
1	1.60	1.40	7.00	7.00	0.10	1.00	12.00	3.00	1.70
1	2.50	1.50	7.00	7.00	0.10	1.00	12.00	3.00	2.70
1	2.50	1.70	7.00	7.00	0.10	1.00	12.00	3.00	2.60
1	2.60	1.80	7.00	7.00	0.10	1.00	12.00	3.00	2.60
1	7.60	1.30	8.00	7.00	0.10	1.00	12.00	3.00	7.60
1	6.00	0.50	8.00	7.00	0.10	1.00	12.00	3.00	6.00
1	6.10	0.80	7.00	7.00	0.10	1.00	12.00	3.00	6.50
1	4.70	0.90	7.00	7.00	0.10	1.00	12.00	3.00	5.00
1	3.60	1.10	7.00	7.00	0.10	1.00	12.00	3.00	3.80
1	3.50	1.20	7.00	7.00	0.10	1.00	12.00	3.00	3.50
1	3.30	1.40	7.00	7.00	0.10	1.00	12.00	3.00	3.70
1	2.20	1.50	7.00	7.00	0.10	1.00	12.00	3.00	2.50
1	1.00	1.70	7.00	7.00	0.10	1.00	12.00	3.00	1.10
1	2.40	2.00	7.00	7.00	0.10	1.00	12.00	3.00	2.50

PT. FRANKLIN	29 APRIL 86	HHRF
0	6.40	0.50
1	5.20	0.70
1	3.10	0.90
1	1.90	1.10

1.00	15.00	3.00	-99.00
1.00	15.00	3.00	5.60
1.00	15.00	3.00	3.60
1.00	15.00	3.00	2.40

1	2.20	1.30	8.00	7.00	0.10	1.00	15.00	3.00	2.20
1	4.60	1.70	8.00	7.00	0.10	1.00	15.00	3.00	4.60
1	2.80	1.90	8.00	7.00	0.10	1.00	15.00	3.00	3.50
1	0.70	2.00	8.00	7.00	0.10	1.00	15.00	3.00	1.00
1	6.90	2.60	7.00	6.00	0.10	1.00	15.00	3.00	7.00
0	7.30	0.50	8.00	7.00	0.10	1.00	15.00	3.00	-99.00
0	7.20	0.60	8.00	7.00	0.10	1.00	15.00	3.00	-99.00
0	6.10	1.20	8.00	7.00	0.10	1.00	15.00	3.00	-99.00
1	5.20	1.30	8.00	7.00	0.10	1.00	15.00	3.00	5.50
1	4.60	1.50	8.00	7.00	0.10	1.00	15.00	3.00	4.70
1	4.70	1.50	8.00	7.00	0.10	1.00	15.00	3.00	4.70
1	4.10	1.60	8.00	7.00	0.10	1.00	15.00	3.00	4.50
1	3.00	1.70	8.00	7.00	0.10	1.00	15.00	3.00	3.40
1	2.20	1.70	7.00	7.00	0.10	1.00	15.00	3.00	2.60
1	1.80	1.80	7.00	7.00	0.10	1.00	15.00	3.00	1.90
1	1.90	1.90	7.00	7.00	0.10	1.00	15.00	3.00	2.00
1	2.60	1.90	7.00	7.00	0.10	1.00	15.00	3.00	2.60
1	4.50	2.10	7.00	7.00	0.10	1.00	15.00	3.00	4.90
1	4.70	2.30	7.00	7.00	0.10	1.00	15.00	3.00	4.70
1	2.90	2.50	7.00	7.00	0.10	1.00	15.00	3.00	3.40
1	1.00	3.30	7.00	7.00	0.10	1.00	15.00	3.00	1.20
1	1.80	0.40	8.00	7.00	0.10	1.00	15.00	3.00	1.80
1	1.60	0.60	8.00	7.00	0.10	1.00	15.00	3.00	1.90
1	1.70	0.70	8.00	7.00	0.10	1.00	15.00	3.00	1.70
1	2.40	0.80	8.00	7.00	0.10	1.00	15.00	3.00	2.40
1	4.10	0.90	8.00	7.00	0.10	1.00	15.00	3.00	4.30
1	3.90	1.10	8.00	7.00	0.10	1.00	15.00	3.00	4.50
1	2.30	1.30	8.00	7.00	0.10	1.00	15.00	3.00	3.00
1	0.80	1.40	8.00	7.00	0.10	1.00	15.00	3.00	1.10
1	1.70	1.60	8.00	7.00	0.10	1.00	15.00	3.00	1.70
1	2.00	1.70	8.00	7.00	0.10	1.00	15.00	3.00	2.00
1	1.80	1.80	8.00	7.00	0.10	1.00	15.00	3.00	1.90
1	2.50	2.00	8.00	7.00	0.10	1.00	15.00	3.00	2.60
1	3.80	1.10	7.00	7.00	0.10	1.00	15.00	3.00	3.90
1	4.50	2.60	7.00	7.00	0.10	1.00	15.00	3.00	4.50
0	6.90	2.90	7.00	7.00	0.10	1.00	15.00	3.00	-99.00
0	5.50	3.10	7.00	6.00	0.10	1.00	15.00	3.00	-99.00
0	4.90	3.10	7.00	6.00	0.10	1.00	15.00	3.00	-99.00
0	4.70	3.40	7.00	6.00	0.10	1.00	15.00	3.00	-99.00
1	1.90	3.70	7.00	6.00	0.10	1.00	15.00	3.00	1.90
0	4.50	4.70	6.00	6.00	0.10	1.00	15.00	3.00	-99.00
1	1.30	2.80	7.00	7.00	0.10	1.00	15.00	3.00	1.50
1	2.90	3.00	7.00	7.00	0.10	1.00	15.00	3.00	3.00

0	7.80	3.70	7.00	6.00	0.10	1.00	15.00	3.00	-99.00
1	4.30	3.90	7.00	6.00	0.10	1.00	15.00	3.00	4.30
1	2.20	4.00	7.00	6.00	0.10	1.00	15.00	3.00	2.80
1	1.30	4.10	7.00	6.00	0.10	1.00	15.00	3.00	1.40
1	1.40	4.20	7.00	6.00	0.10	1.00	15.00	3.00	1.40
1	2.70	2.90	7.00	7.00	0.10	1.00	15.00	3.00	3.20
1	1.70	3.00	7.00	7.30	0.10	1.00	15.00	3.00	2.00
0	4.80	3.50	7.00	6.00	0.10	1.00	15.00	3.00	-99.00
0	3.30	4.40	7.00	6.00	0.10	1.00	15.00	3.00	-99.00
0	8.00	0.80	8.00	7.00	0.10	1.00	15.00	3.00	-99.00
0	8.40	1.00	8.00	7.00	0.10	1.00	15.00	3.00	-99.00
0	6.50	3.20	7.00	6.00	0.10	1.00	15.00	3.00	-99.00

HH-52A	1389	29 APRIL 86	HRRF
0	7.80	0.10	8.00
1	4.40	0.20	8.00
1	1.50	0.30	8.00
0	5.20	0.10	8.00
1	5.10	0.10	8.00
1	2.00	0.40	8.00
1	1.20	0.10	8.00
0	1.10	0.20	8.00
0	5.10	0.50	8.00
1	1.20	0.60	8.00
0	1.90	0.80	8.00
1	1.50	0.60	8.00
0	4.40	0.70	8.00
0	7.80	0.90	8.00
1	2.40	0.60	8.00
1	0.70	0.70	8.00
0	5.20	0.90	8.00
1	2.20	1.10	8.00
1	0.70	1.30	8.00
1	4.60	1.50	8.00
0	7.40	1.00	8.00
0	7.90	1.00	8.00
0	7.30	1.10	8.00

7.00	0.10	1.00	85.00	1000.00	3.00	-99.00
7.00	0.10	1.00	85.00	1000.00	3.00	7.00
7.00	0.10	1.00	85.00	1000.00	3.00	1.60
7.00	0.10	1.00	85.00	1000.00	3.00	-99.00
7.00	0.10	1.00	85.00	1000.00	3.00	5.60
7.00	0.10	1.00	85.00	1000.00	3.00	5.30
7.00	0.10	1.00	85.00	1000.00	3.00	1.40
7.00	0.10	1.00	85.00	1000.00	3.00	-99.00
7.00	0.10	1.00	85.00	1000.00	3.00	-99.00
7.00	0.10	1.00	85.00	1000.00	3.00	1.70
7.00	0.10	1.00	85.00	1000.00	3.00	-99.00
7.00	0.10	1.00	85.00	1000.00	3.00	2.30
7.00	0.10	1.00	85.00	1000.00	3.00	-99.00
7.00	0.10	1.00	85.00	1000.00	3.00	-99.00
7.00	0.10	1.00	85.00	1000.00	3.00	4.10
7.00	0.10	1.00	85.00	1000.00	3.00	1.70
7.00	0.10	1.00	85.00	1000.00	3.00	-99.00
7.00	0.10	1.00	85.00	1000.00	3.00	3.20
7.00	0.10	1.00	85.00	1000.00	3.00	1.60
7.00	0.10	1.00	85.00	1000.00	3.00	5.00
7.00	0.10	1.00	85.00	1000.00	3.00	-99.00
7.00	0.10	1.00	85.00	1000.00	3.00	-99.00
7.00	0.10	1.00	85.00	1000.00	3.00	-99.00

0	4.80	1.20	8.00	7.00	0.10	1.00	85.00	1000.00	3.00	-99.00
1	1.60	1.20	8.00	7.00	0.10	1.00	85.00	1000.00	3.00	3.10
1	5.60	1.40	8.00	7.00	0.10	1.00	85.00	1000.00	3.00	8.30
1	1.20	1.40	8.00	7.00	0.10	1.00	85.00	1000.00	3.00	4.60
1	3.80	1.00	8.00	7.00	0.10	1.00	85.00	1000.00	3.00	3.90
1	1.10	1.20	8.00	7.00	0.10	1.00	85.00	1000.00	3.00	4.10
1	2.60	1.30	8.00	7.00	0.10	1.00	85.00	1000.00	3.00	2.80
1	4.90	1.40	8.00	7.00	0.10	1.00	85.00	1000.00	3.00	5.10
1	1.00	1.50	7.00	7.00	0.10	1.00	85.00	1000.00	3.00	2.80
1	1.70	1.50	7.00	7.00	0.10	1.00	85.00	1000.00	3.00	2.90

41310 30 APRIL 86 HURF

0	7.60	0.10	8.00	5.00	0.30	1.00	15.00	3.00	-99.00
0	6.70	0.20	8.00	5.00	0.30	1.00	15.00	3.00	-99.00
0	5.90	0.30	8.00	5.00	0.30	1.00	15.00	3.00	-99.00
1	4.70	0.40	8.00	2.50	0.10	1.00	15.00	3.00	4.90
0	4.40	0.50	8.00	2.50	0.10	1.00	15.00	3.00	-99.00
1	4.20	0.50	8.00	2.50	0.10	1.00	15.00	3.00	4.20
1	4.30	0.70	8.00	2.50	0.10	1.00	15.00	3.00	4.30
1	6.70	1.10	8.00	2.50	0.10	1.00	15.00	3.00	6.90
1	5.10	1.20	8.00	2.50	0.10	1.00	15.00	3.00	5.40
1	1.50	1.50	8.00	2.50	0.10	1.00	15.00	3.00	1.80
1	1.70	1.60	8.00	2.50	0.10	1.00	15.00	3.00	1.90
0	4.90	1.80	8.00	2.50	0.00	1.00	15.00	3.00	-99.00
0	5.50	0.10	8.00	5.00	0.30	1.00	15.00	3.00	-99.00
0	3.60	0.20	8.00	5.00	0.30	1.00	15.00	3.00	-99.00
1	5.90	0.50	8.00	2.50	0.10	1.00	15.00	3.00	6.10
0	7.60	0.60	8.00	2.50	0.10	1.00	15.00	3.00	-99.00
0	9.00	1.30	8.00	2.50	0.10	1.00	15.00	3.00	-99.00
0	6.10	1.60	8.00	2.50	0.10	1.00	15.00	3.00	-99.00
1	2.50	1.80	8.00	2.50	0.10	1.00	15.00	3.00	3.30
1	0.50	1.90	8.00	2.50	0.00	1.00	15.00	3.00	0.50
1	1.20	2.10	8.00	2.50	0.00	1.00	15.00	3.00	1.20
1	3.50	2.30	8.00	2.50	0.00	1.00	15.00	3.00	3.60
1	4.10	2.40	8.00	2.50	0.00	1.00	15.00	3.00	4.30
0	6.50	2.60	8.00	2.50	0.00	1.00	15.00	3.00	-99.00

1	3.00	3.40	8.00	2.50	0.00	1.00	15.00	3.00	3.00
1	2.30	3.80	8.00	2.50	0.00	1.00	15.00	3.00	2.30
0	7.70	3.60	8.00	2.50	0.10	1.00	15.00	3.00	-99.00
0	7.90	3.70	8.00	2.50	0.10	1.00	15.00	3.00	-99.00
0	7.50	3.20	8.00	2.50	0.00	1.00	15.00	3.00	-99.00
0	7.90	3.20	8.00	2.50	0.00	1.00	15.00	3.00	-99.00
0	8.10	3.30	8.00	2.50	0.00	1.00	15.00	3.00	-99.00
1	6.40	3.50	8.00	2.50	0.00	1.00	15.00	3.00	6.70
1	4.20	3.70	8.00	2.50	0.00	1.00	15.00	3.00	4.40
1	3.50	3.90	8.00	2.50	0.00	1.00	15.00	3.00	3.60
1	0.60	4.10	8.00	2.50	0.00	1.00	15.00	3.00	1.30
1	1.80	4.30	8.00	2.50	0.10	1.00	15.00	3.00	2.00
1	3.10	4.50	8.00	2.50	0.10	1.00	15.00	3.00	3.10
1	2.30	4.60	8.00	2.50	0.10	1.00	15.00	3.00	2.60
1	2.10	4.70	8.00	2.50	0.10	1.00	15.00	3.00	2.20

41335	30 APRIL 86	HRRF							
1	2.90	0.00	8.00	5.00	0.30	1.00	15.00	3.00	3.20
1	2.10	0.20	8.00	5.00	0.30	1.00	15.00	3.00	2.30
1	1.40	0.20	8.00	5.00	0.30	1.00	15.00	3.00	1.70
1	1.20	0.30	8.00	5.00	0.30	1.00	15.00	3.00	1.20
0	2.50	0.40	8.00	2.50	0.10	1.00	15.00	3.00	-99.00
1	3.30	0.50	8.00	2.50	0.10	1.00	15.00	3.00	3.70
1	4.60	0.60	8.00	2.50	0.10	1.00	15.00	0.30	5.10
1	4.70	0.70	8.00	2.50	0.10	1.00	15.00	3.00	4.90
1	2.00	1.10	8.00	2.50	0.10	1.00	15.00	3.00	2.20
0	2.40	1.30	8.00	2.50	0.10	1.00	15.00	3.00	-99.00
0	4.90	1.50	8.00	2.50	0.10	1.00	15.00	3.00	-99.00
1	4.90	1.70	8.00	2.50	0.10	1.00	15.00	3.00	4.90
0	5.80	2.90	8.00	2.50	0.00	1.00	15.00	3.00	-99.00
0	8.30	0.10	8.00	5.00	0.30	1.00	15.00	3.00	-99.00
0	7.00	0.30	8.00	5.00	0.30	1.00	15.00	3.00	-99.00
0	8.90	0.50	8.00	2.50	0.10	1.00	15.00	3.00	-99.00
0	8.40	0.70	8.00	2.50	0.10	1.00	15.00	3.00	-99.00
1	5.80	0.90	8.00	2.50	0.10	1.00	15.00	3.00	6.00
1	5.10	1.00	8.00	2.50	0.10	1.00	15.00	3.00	5.30
1	5.40	1.20	8.00	2.50	0.10	1.00	15.00	3.00	5.50

1	5.40	1.40	8.00	2.50	0.10	1.00	15.00	3.00	5.50
1	4.60	1.50	8.00	2.50	0.10	1.00	15.00	3.00	4.80
1	3.00	1.60	8.00	2.50	0.10	1.00	15.00	3.00	3.50
1	2.60	1.80	8.00	2.50	0.10	1.00	15.00	3.00	2.60
0	3.20	2.00	8.00	2.50	0.00	1.00	15.00	3.00	-99.00
1	2.70	2.10	8.00	2.50	0.00	1.00	15.00	3.00	2.80
1	1.10	2.40	8.00	2.50	0.00	1.00	15.00	3.00	1.10
1	1.50	2.50	8.00	2.50	0.00	1.00	15.00	3.00	1.60
0	4.60	3.70	8.00	2.50	0.00	1.00	15.00	3.00	-99.00
0	3.40	4.00	8.00	2.50	0.00	1.00	15.00	3.00	-99.00
1	1.90	4.80	8.00	2.50	0.00	1.00	15.00	3.00	2.00
1	3.10	2.70	8.00	2.50	0.00	1.00	15.00	3.00	3.40
1	1.20	2.80	8.00	2.50	0.00	1.00	15.00	3.00	1.40
0	2.10	2.90	8.00	2.50	0.00	1.00	15.00	3.00	-99.00
1	3.00	3.20	8.00	2.50	0.00	1.00	15.00	3.00	3.10
1	2.70	3.40	8.00	2.50	0.00	1.00	15.00	3.00	3.00
1	1.70	3.50	8.00	2.50	0.00	1.00	15.00	3.00	1.80
1	2.40	3.60	8.00	2.50	0.00	1.00	15.00	3.00	2.60
1	4.10	3.90	8.00	2.50	0.00	1.00	15.00	3.00	4.50
1	5.20	4.00	8.00	2.50	0.00	1.00	15.00	3.00	5.20
1	4.30	4.30	8.00	2.50	0.00	1.00	15.00	3.00	4.30
1	5.30	4.40	8.00	2.50	0.10	1.00	15.00	3.00	5.40
0	7.10	4.60	8.00	2.50	0.10	1.00	15.00	3.00	-99.00
0	7.10	4.80	8.00	2.50	0.10	1.00	15.00	3.00	-99.00

PT FRANKLIN	30 APRIL 86	HRRF
0	7.60	8.00
0	7.90	8.00
0	8.30	8.00
0	7.80	8.00
1	5.80	8.00
0	5.30	8.00
1	5.00	8.00
1	4.80	8.00
1	1.80	8.00
1	2.60	8.00
1	4.10	8.00

1.00	15.00	3.00	-99.00
1.00	15.00	3.00	-99.00
1.00	15.00	3.00	-99.00
1.00	15.00	3.00	-99.00
1.00	15.00	3.00	6.10
1.00	15.00	3.00	-99.00
1.00	15.00	3.00	5.10
1.00	15.00	3.00	4.80
1.00	15.00	3.00	1.90
1.00	15.00	3.00	2.70
1.00	15.00	3.00	4.10

1	2.50	1.80	8.00	2.50	0.10	1.00	15.00	3.00	3.00
1	1.20	2.00	8.00	2.50	0.00	1.00	15.00	3.00	1.20
1	2.70	0.20	8.00	5.00	0.30	1.00	15.00	3.00	2.80
1	4.10	0.40	8.00	5.00	0.30	1.00	15.00	3.00	4.10
1	2.80	0.70	8.00	2.50	0.10	1.00	15.00	3.00	2.80
1	3.10	0.80	8.00	2.50	0.10	1.00	15.00	3.00	3.10
1	4.80	1.00	8.00	2.50	0.10	1.00	15.00	3.00	4.80
1	6.20	1.10	8.00	2.50	0.10	1.00	15.00	3.00	6.20
0	5.80	1.30	8.00	2.50	0.10	1.00	15.00	3.00	-99.00
1	5.70	1.50	8.00	2.50	0.10	1.00	15.00	3.00	5.70
0	6.80	1.60	8.00	2.50	0.10	1.00	15.00	3.00	-99.00
0	8.50	1.80	8.00	2.50	0.10	1.00	15.00	3.00	-99.00
0	8.40	1.90	8.00	2.50	0.10	1.00	15.00	3.00	-99.00
1	1.60	3.30	8.00	2.50	0.00	1.00	15.00	3.00	2.10
1	1.00	3.40	8.00	2.50	0.00	1.00	15.00	3.00	1.00
1	3.10	3.80	8.00	2.50	0.00	1.00	15.00	3.00	3.10
1	6.10	4.10	8.00	2.50	0.00	1.00	15.00	3.00	6.20
1	7.80	2.10	8.00	2.50	0.00	1.00	15.00	3.00	8.40
1	6.20	2.20	8.00	2.50	0.00	1.00	15.00	3.00	6.80
1	3.60	2.50	8.00	2.50	0.00	1.00	15.00	3.00	3.70
1	3.40	2.60	8.00	2.50	0.00	1.00	15.00	3.00	3.40
1	1.50	2.80	8.00	2.50	0.00	1.00	15.00	3.00	1.90
1	0.30	2.90	8.00	2.50	0.00	1.00	15.00	3.00	0.40
1	2.40	3.10	8.00	2.50	0.00	1.00	15.00	3.00	2.40
1	6.10	3.40	8.00	2.50	0.00	1.00	15.00	3.00	6.10
1	7.80	3.50	8.00	2.50	0.00	1.00	15.00	3.00	7.90
1	7.70	3.70	8.00	2.50	0.00	1.00	15.00	3.00	7.70
1	6.30	3.80	8.00	2.50	0.00	1.00	15.00	3.00	6.70
1	3.50	4.00	8.00	2.50	0.00	1.00	15.00	3.00	3.90
1	3.10	4.20	8.00	2.50	0.00	1.00	15.00	3.00	3.10

HH-52A	1389	30 APRIL 86	HRF
1	4.20	0.00	8.00
1	1.30	0.10	8.00
1	5.80	0.20	8.00
1	0.70	0.20	8.00
0	3.60	0.00	8.00
1	1.30	0.40	8.00
1	2.80	0.50	8.00

1.00	90.00	1000.00	3.00	4.60
1.00	90.00	1000.00	3.00	1.40
1.00	90.00	1000.00	3.00	6.00
1.00	90.00	1000.00	3.00	2.80
1.00	90.00	1000.00	3.00	-99.00
1.00	90.00	1000.00	3.00	1.80
1.00	90.00	1000.00	3.00	4.20

1	4.20	0.60	8.00	2.50	0.10	1.00	90.00	1000.00	3.00	5.30
1	8.50	0.40	8.00	2.50	0.10	1.00	90.00	1000.00	3.00	8.80
1	6.50	0.50	8.00	2.50	0.10	1.00	90.00	1000.00	3.00	6.90
1	0.30	0.70	8.00	2.50	0.10	1.00	90.00	1000.00	3.00	0.40
1	1.70	0.90	8.00	2.50	0.10	1.00	90.00	1000.00	3.00	3.80
1	1.30	0.80	8.00	2.50	0.10	1.00	90.00	1000.00	3.00	2.50
1	5.40	1.00	8.00	2.50	0.10	1.00	90.00	1000.00	3.00	5.40
0	1.10	1.40	8.00	2.50	0.10	1.00	90.00	1000.00	3.00	-99.00
1	7.10	1.50	8.00	2.50	0.10	1.00	90.00	1000.00	3.00	8.80
1	3.70	1.20	8.00	2.50	0.10	1.00	90.00	1000.00	3.00	5.60
1	0.80	1.30	8.00	2.50	0.10	1.00	90.00	1000.00	3.00	1.00
1	3.40	1.40	8.00	2.50	0.10	1.00	90.00	1000.00	3.00	6.50
1	1.80	0.40	8.00	5.00	0.30	1.00	90.00	1000.00	3.00	1.80
1	1.10	1.10	8.00	2.50	0.10	1.00	90.00	1000.00	3.00	1.10

CAPE STARR 01 MAY 86

HEIRF

0	7.10	0.20	7.00	3.00	1.00	2.50	15.00	3.00	-99.00
0	8.10	0.30	7.00	3.00	1.00	2.50	15.00	3.00	-99.00
0	4.80	0.80	7.00	6.00	0.80	2.50	15.00	3.00	-99.00
1	3.90	0.90	7.00	6.00	0.80	2.50	15.00	3.00	4.10
1	3.20	1.00	7.00	6.00	0.80	2.50	15.00	3.00	3.40
1	2.80	1.10	7.00	6.00	0.80	2.50	15.00	3.00	2.90
1	0.60	1.20	7.00	6.00	0.80	2.50	15.00	3.00	1.20
1	0.30	1.30	7.00	6.00	0.80	2.50	15.00	3.00	0.30
1	2.10	1.40	7.00	6.00	0.60	2.50	15.00	3.00	2.30
1	4.90	2.00	7.00	6.00	0.60	2.50	15.00	3.00	5.10
1	4.70	2.10	7.00	6.00	0.60	2.50	15.00	3.00	4.70
1	4.80	2.20	10.00	20.00	0.20	2.50	15.00	3.00	4.80
0	5.00	2.30	10.00	20.00	0.20	2.50	15.00	3.00	-99.00
1	1.40	0.00	7.00	3.00	1.00	2.50	15.00	3.00	1.80
1	0.90	0.10	7.00	3.00	1.00	2.50	15.00	3.00	1.00
1	1.30	0.20	7.00	3.00	1.00	2.50	15.00	3.00	1.40
0	5.10	0.50	7.00	6.00	0.80	2.50	15.00	3.00	-99.00
1	3.80	0.80	7.00	6.00	0.80	2.50	15.00	3.00	4.10
1	3.00	0.90	7.00	6.00	0.80	2.50	15.00	3.00	3.30
1	2.80	1.00	7.00	6.00	0.80	2.50	15.00	3.00	2.80
1	3.00	1.10	7.00	6.00	0.80	2.50	15.00	3.00	3.00
1	5.80	1.50	7.00	6.00	0.60	2.50	15.00	3.00	5.90
1	8.50	2.10	7.00	6.00	0.60	2.50	15.00	3.00	8.50

0	8.70	2.10	7.00	6.00	0.60	2.50	15.00	3.00	-99.00
0	9.20	2.20	7.00	6.00	0.60	2.50	15.00	3.00	-99.00
1	3.90	0.40	7.00	3.00	1.00	2.50	15.00	3.00	4.00
1	3.00	0.50	7.00	3.00	1.00	2.50	15.00	3.00	3.60
1	0.30	0.70	7.00	6.00	0.80	2.50	15.00	3.00	0.80
1	0.80	0.80	7.00	6.00	0.80	2.50	15.00	3.00	0.80
1	6.30	1.10	7.00	6.00	0.80	2.50	15.00	3.00	6.40
1	3.10	1.40	7.00	6.00	0.60	2.50	15.00	3.00	3.70
1	1.20	1.60	7.00	6.00	0.60	2.50	15.00	3.00	1.70
1	0.60	1.70	7.00	6.00	0.60	2.50	15.00	3.00	0.60
1	3.30	2.00	7.00	6.00	0.60	2.50	15.00	3.00	3.30
1	6.80	2.30	10.00	20.00	0.20	2.50	15.00	3.00	7.10
1	3.70	2.40	10.00	20.00	0.20	2.50	15.00	3.00	4.10
1	3.10	2.50	10.00	20.00	0.20	2.50	15.00	3.00	3.40
1	2.90	2.70	10.00	20.00	0.20	2.50	15.00	3.00	2.90
1	3.80	2.80	10.00	20.00	0.20	2.50	15.00	3.00	3.90
1	4.50	3.10	10.00	20.00	0.20	2.50	15.00	3.00	5.00
1	3.40	3.20	10.00	20.00	0.20	2.50	15.00	3.00	4.10
1	2.20	3.30	10.00	20.00	0.20	2.50	15.00	3.00	2.70
1	0.70	3.40	10.00	20.00	0.20	2.50	15.00	3.00	1.00
1	8.30	2.40	10.00	20.00	0.20	2.50	15.00	3.00	9.00
1	7.10	2.60	10.00	20.00	0.20	2.50	15.00	3.00	7.50
1	6.30	2.70	10.00	20.00	0.20	2.50	15.00	3.00	6.60
1	4.20	3.00	10.00	20.00	0.20	2.50	15.00	3.00	4.80
1	7.40	2.60	10.00	20.00	0.20	2.50	15.00	3.00	7.50
1	7.60	2.70	10.00	20.00	0.20	2.50	15.00	3.00	7.70
0	9.20	3.00	10.00	20.00	0.20	2.50	15.00	3.00	-99.00
0	5.90	3.30	10.00	20.00	0.20	2.50	15.00	3.00	-99.00

HH-52A	1463	01 MAY 86	HRF						
1	4.20	0.10	7.00	6.00	0.60	2.50	90.00	1000.00	3.00
1	7.80	0.20	7.00	6.00	0.60	2.50	90.00	1000.00	3.00
1	1.70	0.30	10.00	20.00	0.20	2.50	90.00	1000.00	3.00
1	0.90	0.30	10.00	20.00	0.20	2.50	90.00	1000.00	3.00
1	2.10	0.50	10.00	20.00	0.20	2.50	90.00	1000.00	3.00
									5.00
									8.60
									4.90
									1.00
									4.40

1	2.90	0.50	10.00	20.00	0.20	2.50	90.00	1000.00	3.00	3.30
1	2.20	0.10	7.00	6.00	0.60	2.50	90.00	1000.00	3.00	4.90
1	1.50	0.20	7.00	6.00	0.60	2.50	90.00	1000.00	3.00	1.70
1	1.90	0.30	10.00	20.00	0.20	2.50	90.00	1000.00	3.00	3.80
1	5.80	0.50	10.00	20.00	0.20	2.50	90.00	1000.00	3.00	8.20
1	0.90	0.00	7.00	6.00	0.60	2.50	90.00	1000.00	3.00	4.40
1	4.20	0.30	10.00	20.00	0.20	2.50	90.00	1000.00	3.00	6.20
1	2.40	0.70	10.00	20.00	0.20	2.50	90.00	1000.00	3.00	4.10
1	2.30	0.90	10.00	20.00	0.20	2.50	90.00	1000.00	3.00	2.80
1	0.60	0.60	10.00	20.00	0.20	2.50	90.00	1000.00	3.00	3.80
1	2.70	0.70	10.00	20.00	0.20	2.50	90.00	1000.00	3.00	4.10
1	8.40	1.00	10.00	20.00	0.20	2.50	90.00	1000.00	3.00	8.90
1	6.40	0.60	10.00	20.00	0.20	2.50	90.00	1000.00	3.00	8.30
1	3.40	0.70	10.00	20.00	0.20	2.50	90.00	1000.00	3.00	4.20
1	1.50	1.00	10.00	20.00	0.20	2.50	90.00	1000.00	3.00	2.10
1	3.80	1.20	10.00	20.00	0.20	2.50	90.00	1000.00	3.00	3.80
1	5.80	1.30	10.00	20.00	0.20	2.50	90.00	1000.00	3.00	7.30
1	0.60	1.40	10.00	20.00	0.20	2.50	90.00	1000.00	3.00	1.20
1	2.30	1.30	10.00	20.00	0.20	2.50	90.00	1000.00	3.00	3.30
1	5.20	1.20	10.00	20.00	0.20	2.50	90.00	1000.00	3.00	5.40

HH52A	1418	01 MAY 86	HRF
1	0.50	0.40	7.00
0	2.70	0.70	7.00
1	1.00	0.50	7.00
1	4.10	0.60	7.00
0	4.20	0.60	7.00
1	6.10	0.40	7.00
1	1.40	0.60	7.00
0	3.80	1.20	7.00
1	0.50	1.20	7.00
1	5.00	1.30	7.00
1	8.80	1.40	7.00
1	4.40	1.50	7.00
1	1.50	0.70	7.00
0	8.40	0.80	7.00
1	3.90	1.10	7.00
1	3.20	1.20	7.00

3.00	2.50	90.00	1000.00	3.00	2.40
3.00	2.50	90.00	1000.00	3.00	-99.00
3.00	2.50	90.00	1000.00	3.00	1.00
3.00	2.50	90.00	1000.00	3.00	5.30
3.00	2.50	90.00	1000.00	3.00	-99.00
3.00	2.50	90.00	1000.00	3.00	6.70
3.00	2.50	90.00	1000.00	3.00	2.20
3.00	2.50	90.00	1000.00	3.00	-99.00
3.00	2.50	90.00	1000.00	3.00	1.60
3.00	2.50	90.00	1000.00	3.00	7.50
3.00	2.50	90.00	1000.00	3.00	9.50
3.00	2.50	90.00	1000.00	3.00	4.60
3.00	2.50	90.00	1000.00	3.00	5.00
3.00	2.50	90.00	1000.00	3.00	-99.00
3.00	2.50	90.00	1000.00	3.00	5.60
3.00	2.50	90.00	1000.00	3.00	3.20

0	7.20	1.30	7.00	6.00	0.80	2.50	90.00	1000.00	3.00	-99.00
0	11.30	1.40	7.00	6.00	0.80	2.50	90.00	1000.00	3.00	-99.00
0	5.90	0.70	7.00	3.00	1.00	2.50	90.00	1000.00	3.00	-99.00
1	3.70	0.80	7.00	3.00	1.00	2.50	90.00	1000.00	3.00	3.80
1	4.00	1.00	7.00	6.00	0.80	2.50	90.00	1000.00	3.00	5.90
1	0.10	1.10	7.00	6.00	0.80	2.50	90.00	1000.00	3.00	1.50
1	3.60	1.40	7.00	6.00	0.80	2.50	90.00	1000.00	3.00	3.70
1	3.70	1.70	7.00	6.00	0.80	2.50	90.00	1000.00	3.00	3.70
0	3.50	0.30	7.00	3.00	1.00	2.50	90.00	1000.00	3.00	-99.00

41335 05 MAY 86 HRRF

0	8.00	0.30	15.00	10.00	0.10	2.50	15.00	3.00	-99.00
0	7.90	0.40	15.00	10.00	0.10	2.50	15.00	3.00	-99.00
0	8.20	0.50	15.00	10.00	0.10	2.50	15.00	3.00	-99.00
0	7.20	0.80	15.00	10.00	0.10	2.50	15.00	3.00	-99.00
1	4.50	1.20	15.00	10.00	0.10	2.50	15.00	3.00	4.60
1	4.10	1.30	15.00	10.00	0.10	2.50	15.00	3.00	4.10
1	3.80	1.50	15.00	10.00	0.10	2.50	15.00	3.00	3.80
1	0.40	2.30	15.00	10.00	0.10	2.50	15.00	3.00	0.60
1	4.50	0.00	15.00	10.00	0.10	2.50	15.00	3.00	4.70
1	3.40	0.10	15.00	10.00	0.10	2.50	15.00	3.00	4.80
1	2.50	0.20	15.00	10.00	0.10	2.50	15.00	3.00	2.90
1	1.60	0.40	15.00	10.00	0.10	2.50	15.00	3.00	1.70
1	1.50	0.50	15.00	10.00	0.10	2.50	15.00	3.00	1.50
1	2.10	0.60	15.00	10.00	0.10	2.50	15.00	3.00	2.20
1	2.20	0.70	15.00	10.00	0.10	2.50	15.00	3.00	2.30
1	2.00	0.80	15.00	10.00	0.10	2.50	15.00	3.00	2.00
1	2.10	0.90	15.00	10.00	0.10	2.50	15.00	3.00	2.10
0	1.90	1.10	15.00	10.00	0.10	2.30	15.00	3.00	-99.00
1	0.90	1.50	15.00	10.00	0.10	2.30	15.00	3.00	1.10

1	6.10	0.70	15.00	10.00	0.10	2.50	85.00	1000.00	3.00	6.50
1	1.00	0.80	15.00	10.00	0.10	2.50	85.00	1000.00	3.00	2.70
1	8.80	0.70	15.00	10.00	0.10	2.50	85.00	1000.00	3.00	9.20
1	7.00	0.80	15.00	10.00	0.10	2.50	85.00	1000.00	3.00	8.30
1	2.20	0.90	15.00	10.00	0.10	2.50	85.00	1000.00	3.00	4.40
1	1.50	1.00	15.00	10.00	0.10	2.50	85.00	1000.00	3.00	3.20
0	1.80	1.20	15.00	10.00	0.10	2.50	85.00	1000.00	3.00	-99.00
1	1.30	1.30	15.00	10.00	0.10	2.50	85.00	1000.00	3.00	2.30
1	4.20	1.40	15.00	10.00	0.10	2.50	85.00	1000.00	3.00	4.40
1	3.10	1.10	15.00	10.00	0.10	2.50	85.00	1000.00	3.00	3.10
1	4.50	1.40	15.00	10.00	0.10	2.50	85.00	1000.00	3.00	4.70